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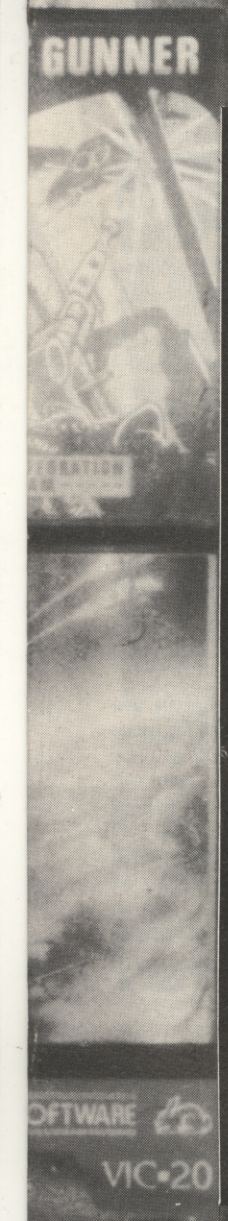


CLASSIC GAMES

SHARP

Computer & Video Games' very own contributor, John Ball, has come up with the goods on **Sharpsoft's** version of Othello.

Complete with loud bleeps, every time it makes a move, the machine plays a very good standard of Reversi and defeated all my attempts to force it into submission.

Even reading John's column on the subject and obeying his guidelines with regard to corner squares and understanding what the computer was up to didn't help.

It had a particularly frustrating habit of turning the tables on me at the end of a game just as I thought I had un unbeatable position.

The screen presentation is simple as Sharp graphics force it to be but simplicity suits Othello and it is a very playable game with a good response time. Only buy it if you can stand to be beaten. It costs **£6.90.**

- **Getting started** 7
- **Value** 8
- **Playability** 9

SPECTRUM

Reversi, or Othello as it is often called, is a nineteenth century game of territorial acquisition. Strategy and skill are needed to win.

Two versions of the game are currently available for the Sinclair Spectrum, and both run on the unexpanded machine. One is by **Mine of Information,** for Sinclair Research, and the other has been written by **Microx,** based at Worthing, Sussex.

The Sinclair version comes in a very pleasant package, the cassette insert is colourful and packed with information. Beginners should soon become well-versed in the game by simply reading it.

The program loaded without any problems and ran immediately. The game is fairly standard, but with many interesting features.

To begin with, there are nine skill levels, with a three-second response time at level 1.

You can challenge the computer, with either the Spectrum or yourself starting, or you may play against a friend with the computer acting as umpire.

If you are a beginner, you may review a sample game at your leisure. Half-way through a game you may change sides, and at the end of one, you may review all the moves of the game.

The graphics are fair, and there is even a facility to change border, paper and ink colours to your requirements. All in all, this is a most magnificent game.

I wish I could say the same for the Microx version. The purchaser is greeted by a most unappealing package bearing the company's name and the program title.

After sorting out the loading problems, which I have never had with any other cassettes, I was confronted with a page of confusing text which would leave the beginner completely bemused.

The game itself has a rather uninteresting screen display, and makes average use of colour.

When I tried the program on a monochrome television set, the players' pieces were almost indistinguishable.

The program is written in Basic, and there is only one skill level. The computer's moves are average, about equal to the moves of level one on the Sinclair cassette.

The computer does not check if an opponent has had to pass, and if "enter" is pressed without a move being keyed in, your turn is overlooked.

For my money, the Sinclair cassette has to be my choice. Microx Othello is no comparison to Sinclair Reversi, and I would not even consider purchasing it. Sinclair Reversi is available at **£7.95** and Microx Othello at **£3.50.**

Sinclair Reversi

- **Getting started** 9
- **Value** 8
- **Playability** 8

Microx Othello

- **Getting started** 6
- **Value** 5
- **Playability** 5

The growling gravelly voice of **Quicksilva's** Chess program does not add much to the game.

However, its sharp comments on the current state of play do give this program a slightly more human feel.

There's a surge of pride each time it finds itself in more difficulties than it expected and says so on screen. And after being roundly criticised for a queen sacrifice, "That was a pathetic move!" I enjoyed mating it five moves later all the more.

The program does respond quickly at the lower levels but does not play a particularly good opening and has a tendency to capitulate utterly when things start going wrong.

Still, it will give beginners a hard game and will probably hand out more beatings than it takes.

The presentation on the Spectrum is a problem and the screen takes some getting used to. With several of the pieces barely recognisable from their board equivalents. While good chess players know (by colour and position) where the king and queen start a game, learners will not have such a clear idea.

Probably a bit too gimmicky for the more serious chess enthusiast and perhaps not enough thought for the complete beginner to help him around the little things most of us take for granted. It costs **£6.95** and runs on the 48K model.

- **Getting started** 6
- **Value** 8
- **Playability** 5

The Spectrum's graphics face a severe test when asked to produce a good chess board with easily distinguished pieces.

So far I have yet to see a board which is easy on the eye and doesn't have at least two piece symbols too close for comfort. The **Psion** game, which comes courtesy of Microgen, seems to have trouble with pawns and bishops and I had to look hard in some positions to spot a bishop hiding in a pawn chain.

Given this problem and the usual difficulties with keying-in the E2-E4 format, which usually causes me problems when keen to play a good move with black, it's a pity this game does not include a facility to allow you to change mistakes.

Many an interesting position went down the drain after I simply mispressed a square and sent a rook, pawn or queen into a dangerous position instead of the one I intended.

Still this Psion tape is probably the best Spectrum chess around so if you can learn to live with these shortcomings, you will manage to get some decent games out of it.

The levels are 0-9 and levels one, two and three all play a fast and fair game.

The program allows you to set up a board position to play from and I particularly enjoyed the chance to turn the screen position and moves so far onto the Spectrum printer. Current games can also be saved on cassette. The game costs **£7.95.**

- **Getting started** 8
- **Value** 8
- **Playability** 7

VIC-20

Bug-Byte is offering the lowest-priced Vic Chess game I have come across but you will already need to have at least 16K worth of memory expansion on your basic machine.

It also takes a step in the right direction by getting away from the overused notion of chess levels. Instead the Bug-Byte programmers ask the player to input a three-figure number from

Time and motion

The classic board games transfer well to computers who make better than average opponents on all the games dealt with here.

But there is more to choosing a chess, backgammon, draughts or reversi program, than picking one which will beat you every time.

Most important in these programs are a display that is clear and easy on the eye, coupled with pieces which can be easily recognised. Programs which use disturbing colour clashes or badly shaped pieces will hardly help a player trying to give careful study to a critical position.

The program should also draw a player's attention to its move. Both an audio and visual signal should be included to let the player know it's moving and which piece it is changing.

A good response time is crucial. If left to its own devices for long enough most computers can come up with a good move. But long study should be the human player's prerogative — computers are used for their speed.

Finally an easy-to-understand, and implement, move input system will ensure that the program does not start gathering dust after the first few tries. In chess it is difficult to come up with anything better than E2-E4 but this can easily lead to a mistake which is still a valid move and completely ruin a player's chances.

Few programs allow the player to take a move back, try and find one that does.

Other key things to question with regard to chess: does the program always respond to P-Q4 openings the same way? If so you're in for a dull opening repertoire. Does it play forced moves quickly? Does it keep its head when things go wrong? Some programs just give up on bad positions.

TERRY PRATT

0–9.99 to determine the play.

The number before the decimal point is the number of moves it looks ahead at each position. The number after the point refers to the number of positions the computer will consider at each play.

Of course if you start getting ambitious then the computer begins eating into huge amounts of time as it considers vast amounts of data before replying. In play at the lower end of the scale it produced some difficult to understand moves.

The display of the pieces is also a little simplistic and the king and queen symbols are initially confusing. It costs **£7.00.**

- **Getting started** 9
- **Value** 7
- **Playability** 5

Boss plays chess on the Vic-20 only with the aid of an 8K expansion to the Basic memory.

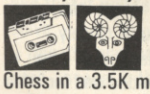
But it is a marvellous piece of software with levels 0 to 9 taking you from a one second to a four hour response time.

There is a good book opening built into this program and it stayed within a known variation usually to the sixth or eighth move on most familiar openings.

Boss also scores on the display, which is more than just adequate — it is produced with a veritable flourish. It accepts entries in four key strokes and will also run chess clocks on both players which offers the additional challenge of trying to beat the computer while taking less time than it does.

A couple of criticisms though: it is difficult to spot the computer's last move as the pieces don't flash after moving and the tape was not a first-time loader. It costs **£14.99** and is distributed here by **Audiogenic.**

- **Getting started** 6
- **Value** 9
- **Playability** 8



Chess in a 3.5K memory is what **Commodore** are offering for the basic Vic-20.

The catch is that it comes in cartridge form with the attendant rise in price to **£21.70.**

But you do get value for money. The game top scores in our getting started category with a simple plug-in operation and a comprehensive booklet explaining what can and can't be done on each of the six possible levels.

The program has a good pedigree, with the Sargon name behind it and is based on the Sargon II program first devised for the Apple.

The board display is easily distinguished and the six levels well spaced out with an almost instantaneous response at the lowest level.

It plays a good game and it's very hard to fault this well put together package except on the price.

- **Getting started** 10
- **Value** 8
- **Playability** 7

ZX81

Artic's 1K Chess is an attempt to get a complex strategy game into the minimum of memory space and as such can only be a compromise.

To make this compromise too much has had to be left out. You are not allowed to Castle, capture en-passant or even promote your pawns and to crown it all even a victory is not acknowledged by the computer. You'll have to spot it for yourself.

The board is little more than an 8×8 square of spaces and inverse spaces with the pieces represented by their initials either in white or black or in black on white. This is the cause of confusion later in the game, when pieces have been forgotten.

Worse still it keeps moving its pieces around the board while it makes up its tiny 1K mind what its next move will be.

Still it does play chess — just — a considerable achievement in 1K.

This is not so much a game as a feat of programming which, in itself, ought to make 1K Chess a collector's item. It does just about succeed in playing chess but don't expect to play too many memorable games on it. Just admire the thought and dedication which made such a thing possible.

A considerable achievement for only **£2.95.**

- **Getting started** 7
- **Value** 8
- **Playability** 4

Backgammon is a three-thousand year-old game of chance and skill for two people. This Psion/Sinclair version for the 16K ZX81, is most impressive.

The cassette is well packaged, with the insert containing five pages of information including the history, rules and all other aspects of the game of backgammon which are relevant to beginners and experts alike.

The program loaded without much difficulty.

There are four skill levels and the game can run in fast or slow mode. This simply means that if the computer is taking it's turn and it is in fast mode, the screen goes blank and it makes up its mind four times faster.

The 81 plays an adequate game at level 1, and plays extremely well at level 4.

The graphics are adequate, with normal and inverse '0's representing the two players' pieces. Entry of moves is very simple, as is accepting or rejecting the doubling cube — which the computer controls very well.

You only have to press one key, and the ZX81 always asks you to confirm your entries.

Backgammon costs £5.95 from Sinclair Research. There is a Dice program on side B of the cassette.

- **Getting Started** 8
- **Value** 8
- **Playability** 8

DRAGON

Dragon Games 1 and 2 are tape compendiums for this new micro from **J. Morrison Micros** of Leeds.

All the games are written in Basic and a great deal can be learned by the would-be games programmer who finds time to study the listings.

Othello, on Dragon Games 1, plays a standard game but it does not give any instructions or rules. Breakout is the second game on this tape and in this version of the arcade machine you play against the clock to score as many points as possible. A conventional bat is not used — you simply fire your projectile using the space bar.

Moonlander is the third game on tape one and is a fairly good representation of this well-known computer game. Awari is a copy of the African national game, which for the uninitiated is played with pebbles. Numbers are used to display the counters, but like Othello you are not told how to play the game.

The final program on Dragon Games 1 is called Raffles. In it your task is to find hidden treasure. A sleeping dog guards the treasure rooms. This is a short graphic adventure — and although simple I found it quite addictive.

It costs **£5.95.**

- **Getting started** 8
- **Value** 7
- **Playability** 7

BBC

If you're a keen Reversi — also known as Othello — player, you'll get extra value for money playing **BBC Publications'** version for the BBC Model A or B.

The games of Galaxy, Gomoku and Mastermind are all included on the same tape, which goes under the name Strategy Games for the BBC micro.

The Reversi game features a well-produced but simple display and I found the move entry system of letters appearing in all the legal positions very easy to cope with. The game plays to a high standard but is not unbeatable.

With the other three games it's good value at **£10.**

- **Getting started** 8
- **Value** 9
- **Playability** 8

ATARI

Strip Poker is a game for the adults who are fed up with Space Invaders, Pacman and all the rest. More precisely it's a game for men as it features two model girls gambling their clothes in a computerised round of poker.

Suzi and Melissa each have their own style of play. One is a skilled poker player the other is fairly inept. The game requires a large amount of memory — 40K — and runs on the Atari 400/800 with a disc drive. Versions will shortly be available for the Apple.

For people who are likely to be trying the game out at work it has the sensible device of being able to black out the screen at any time. Useful if your boss (or the children!) turn up unexpectedly in the computer room!

Strip Poker is manufactured by **Allrian** of Hayes, Middlesex and retails at **£27.50.**

- **Getting started** 9
- **Value** 6
- **Playability** 7

ADVENTURE GAMES

ATARI

This is your chance to play sleuth for an afternoon as you are challenged to solve the Murder At Awesome Hall.

Colonel Awesome lies dead on the floor of his 20 room mansion.

You must find out who did it, in which room, and with what murder weapon.

Clues in the shape of an on-screen map of the mansion's first floor and ground floor.

After entering a room pressing "Q" enables you to find out who or what is in a room. If any of the Colonel's associates are in the room you can question them.

The computer will also give you a list of suspects, extra clues if you need them, and the solution for the completely exasperated.

This game is not visually exciting and if you do not like solving puzzles can become rapidly boring.

The game runs on a 16K Atari and is available from **Calisto Computers** at **£14.95.**

- **Getting started** 8
- **Value** 5
- **Playability** 5

Childhood fantasy

Adventure is what all small boys — and most bigger ones — long for. Remember all those childhood books that took you into a world of excitement and fantasy? Didn't you, like me, wish you were one of the Famous Five?

Adventure gaming will take you one step nearer to your dreams, in the comfort of your own home.

Originally written for large mainframe computers, these games have now been brought to the masses via the micro. Adventures are being published in ever increasing numbers for every popular machine.

An Adventure game makes you the would-be hero. You move about from one location to another, examine things, pick up and manipulate objects, and solve puzzles. But all the time danger lurks and hidden enemies may strike at any time.

Your goal may be anything from collecting priceless treasures to saving the world from disaster. You become part of the story, the computer working to calculate what your actions will achieve within the plot devised by the author.

Don't expect fancy graphics in an Adventure — although there are graphic Adventures. Expect words. Your imagination will provide the pictures — just like it does when you read a good book. And like a good book, you will find it just as difficult to put down.

When buying an Adventure first discover if the scenario and degree of complexity suit your tastes. Games reviews will help here. Find out if the speed of the game is right for you as there is a great deal of variation.

From my experience a minimum of 16k of memory is required for a decent adventure and from there on up the bigger the better. A "save game" feature is useful as it enables you to return to a game where you left it at a later stage without having to leave the machine running all night.

If your computer has sound and colour these will enhance a game. But for the purist a good plot is enough.

KEITH CAMPBELL

SPECTRUM

Faust was a German who sold his soul to the devil, and hid many treasures.

The player is led near to the treasures and must then find them. The creatures encountered in the quest are mutants from long ago.

That is the setting of this game, which although mainly text, is accompanied by mini-pictures of the objects as they are mentioned.

The screen during play has varied colours, which combined with some simple sound effects make for a quite pleasing Adventure from **Abbex** of London for the 16K Spectrum at **£4.95.**

- **Getting started** 10
- **Value** 8
- **Playability** 8

This series of adventures displayed as plain scrolling black text on a pale yellow background, the conversation scrolling continuously up the screen.

In itself this is acceptable. But is spoiled by the fact that when a lot of conversation has been held at one place and the location details have long since disappeared, there seems to be no way of recalling them. The lack of a cursor can also be confusing.

Planet of Death, for the 16K Spectrum, sets you down on an alien planet where your space ship has been captured and disabled. You must find it and escape.

The environment here seemed just like earth to me — very mundane. Most things I tried to do proved impossible or went unrecognised. A weak theme and frustrating game.

Inca Curse, for the 48K Spectrum, places you in a South American jungle outside an Inca temple. This you must explore and return with as much treasure as possible.

Quite a good game with plenty of exploring to do, and points to score, but a disaster from an educational point of view.

Spelling is obviously not the author's strong point! I came across "vandels", an "armary", and "hyroglithics"!

The publishers claim 3200 to be the maximum number of points to have been scored to date. Could this be the total number of spelling errors in the game?

In Ship of Doom which runs on the 48K Spectrum you are in a space ship which has been drawn into an alien cruiser by a Gravitron beam. The aliens are rounding-up humans to turn them into androids.

Your mission — to press the main computer control button to free your ship. There are endless corridors and rooms to roam about, with some strange devices whose purposes are not obvious.

The control button is easily found, but covered by seemingly unbreakable glass! Quite an interesting adventure, if SF is for you!

Espionage Island, again for the 48K Spectrum, puts you under pressure from the start. You are in an aircraft which has been shot at, and you can see a parachute and lever. Your mission is to find the secret of the island on which you were spying from above, but first you must get there.

The island is populated by natives — and hides a guarded camp.

Are the things you find in the wreckage of your aircraft a clue? Can you penetrate the camp? And will you be able to return to your aircraft carrier base? Quite an exciting Adventure.

This series of adventures from **Artic Computing** of Hull, seems to improve alphabetically! I can hardly wait for Adventure 'E'. The Adventures cost **£6.95** each.

Planet of Death

- **Getting started** 10
- **Value** 6
- **Playability** 3

Ship of Doom

- **Getting started** 10
- **Value** 6
- **Playability** 6

Inca Curse

- **Getting started** 10
- **Value** 6
- **Playability** 5

Espionage

- **Getting started** 10
- **Value** 7
- **Playability** 7

At last a realistic 007 adventure! The mode of play is quite different from most Adventure games, successfully recreating the world of James Bond on a computer.

You are 007, of course, and M takes you to Q to choose your weapons.

You then repeatedly select destinations from a list of cities around the world and the micro takes you there.

On arrival you may be offered a ride by a mysterious taxi, or given clues in the form of one letter of an anagram to enable you to solve where a missing jet with a nuclear bomb has disappeared to.

Meanwhile, you must save London from a threat of destruction by Dr. Death.

An original presentation, from **Richard Shepherd Software** of Maidenhead, with authentic 'feel' of a James Bond novel. It costs **£6.50.**

- **Getting started** 5
- **Value** 7
- **Playability** 9

As The Hobbit loads, an illustrated title page is displayed, rather like the cover of a book.

Indeed, the book *The Hobbit* by J.R.R. Tolkien is supplied as part of the package, and it is advisable to read this before playing, since the game follows the theme quite closely.

Another booklet describing how to play the game is provided and includes hints on the plot and how *"Inglish"*, the command language works.

In play the screen is split in two. A "communication window" at the bottom scrolls independently from the "adventure window" above which gives details about the location and action.

On his first visit to a location the player is rewarded with a colour illustration of it.

The action is continuous, since The Hobbit is played in real time.

The creatures go about their business whilst the player is thinking.

Whilst head-scratching is in progress it is quite likely that more messages

will appear on the screen, such as "Thorin goes east through the green door" or "Gandalf gives you the map". The publishers call this feature "Animaction", and it means there is no unique solution, the game being slightly different every time it is played.

A charming Adventure, requiring considerable time to complete.

The Hobbit comes from **Melbourne House** for the 48K Spectrum at **£14.95.**

- **Getting started** 10
- **Value** 9
- **Playability** 9

Pimania really IS different! It is a complete entertainments package!

It all starts with a flashing picture of the Golden Sundial of Pi, a prize worth £6,000 offered to the first person to solve the puzzle.

The player is accompanied by the Pi Man, who starts off by laughing himself silly, and proceeds to offer extremely disconcerting comments.

The game offers a series of puzzles and clues, interspersed with funnies. Like a little man who for no reason walks boldly on to the screen and dances the Hokey Kokey to music, a dog that walks up to a tree and barks at it, and a commercial break offering Pimania tee-shirts in grotesque colours and sizes which are all out of stock!

So when the player gets thoroughly frustrated over a problem, the chances are that a good laugh is just around the corner.

The computer program is complemented by a catchy audio number on the reverse side of the tape, "Pimania" by Clair Sinclive and the Pimen. Show business, pork pies, and a deal are among other things feature in this.

I suspect that there are clues hidden in every part of the whole package, and that it will take a very long time to solve.

One thing is certain — it will never bore anyone with a sense of humour!

Pimania is available from **Automata** of Portsmouth and runs on the 48K Spectrum and 16K ZX81. It costs **£10** for the Spectrum and **£8** for the ZX81.

- **Getting started** 6
- **Value** 10
- **Playability** 10

DRAGON

Go adventuring on your Dragon in the Forbidden City in this text adventure produced by **Apex Trading** of Brighton.

Loading instructions were supplied on computer printout paper and the packaging was poor. Loading was also difficult. The program is short, taking just over a minute to load once your computer accepts it.

It is a standard Adventure. The player has to enter a city, find a treasure and escape. A short introduction to the game gives you three "key words" — the rest you must discover for yourself.

Your location is printed at the top of the screen and the input prompt "what now?" at the bottom.

Various dangers encountered along the way include force fields, lasers and a mysterious green mist.

As with all Adventure games once solved it becomes unplayable. Unfortunately the game did not make full use of the Dragon's reasonable RAM. However it did provide some hours of amusement. Versions available for the Dragon at **£4.95** and TI 99/4a at **£3.95.**

- **Getting started** 3
- **Value** 6
- **Playability** 6

Goblin Caves, for the Dragon 32, comes from **Apex Trading** of Brighton and as with other tapes from this company the packaging was poor and loading presented some problems.

The game is written in Basic and can be listed so it might prove useful to any one who is learning the art of programming.

As for the game itself, it's a 3D adventure, the aim being to find and kill a monster with a fire arrow. The arrows are useful protection against any goblins you may come across.

A view of the location you are in is drawn in hi-res graphics. This is redrawn after every move — and becomes annoying after a while.

The player enters the direction he wishes to face and then presses the 'F' key to move forward. The space bar is used to fire arrows.

As it stands this is a fair game, but improvements could be made. I would like to see the monsters and goblins represented graphically — instead of using text. I also feel it would be a better program if it was re-written in machine code. It costs **£4.95.**

- **Getting started** 6
- **Value** 6
- **Playability** 6

APPLE

Softporn Adventure is like no other adventure game you have ever played before. Instead of dealing with trolls and wizards you are challenged to find and seduce three women.

The key to the game is the amount of money you have on you. You start the game with a thousand dollars but this will not last you long as whisky costs a hundred dollars a shot and you will need to bribe the manager of the club to get into his seamy disco-casino. The only way to build up your cash supply is to gamble a few dollars in the casino.

If you are hoping for hi-res graphics depicting scantily clad young women then Softporn Adventure is not for you. It's a text only adventure with only written results of your moves appearing on the screen.

UK suppliers of Softporn Adventure are **SBD Software** in Richmond. It runs on a 48K Apple and costs **£17.95** — far cheaper than a real night out in a seamy casino.

- **Getting started** 9
- **Value** 6
- **Playability** 6

Deadline enables you to play your favourite sleuth for an afternoon as you weigh up the clues in this superb crime solving adventure.

You get a complete dossier of a crime committed on the 7th June 1982 when the wealthy industrialist Marshall Robner died of an overdose of Ebullion — an anti-depression drug he had been taking for some time. But was it suicide or was it murder?

Your brown folder contains all the documentary evidence. This includes the Coroner's report, a large black and white photograph of the scene of death with a white chalk line showing the position and outline of where the body had been found and a letter from Mr Marshall's Attornies.

This immensely popular game in America is now available in the UK from **Pete and Pam Computers** running on an Apple II and retailing athe slightly expensive price of **£39.25.**

- **Getting started** 9
- **Value** 4
- **Playability** 7

The Goblins which gave their name to this Apple adventure, also serve as its most unique feature.

While the player is challenged to pit his wits against a horde of horrible monsters and nasty traps, the Goblins hide in the countryside scenes — presented in hi-res graphics.

If the adventurer is found loitering too long in any particular location, the Goblin will rush in to the attack with a good chance of killing the poor soul off.

The game comes from **Highland Computer Services** of the US and costs **£15.95.** But it has only brief instructions on the disc and far too many arbitrary deaths.

- **Getting started** 6
- **Value** 7
- **Playability** 7

MAZE GAMES

SPECTRUM

Based on Pacman but adding a few twists of its own comes this latest game from the business software firm **Campbell Systems.**

Gulpman offers good instructions with a comprehensive list of game options.

There were fifteen different mazes to choose from with an option to vary the speed of the Gulpman and his chasers.

Another interesting feature is a laser gun with a limited amount of energy with which you can shoot the chasers.

On the minus side Gulpman has pretty basic graphics. The Pacman, for example, moves around the maze without moving his legs. It would have been more convincing had the program simulated some sort of running motion.

At **£4.95** I found this the most playable of the batch of Spectrum maze games tested. The variety of mazes adds interest.

- **Getting started** 9
- **Value** 6
- **Playability** 7

Spookyman sounds more like the title of a new horror comedy film than the name of the latest Pacman type game for the Sinclair Spectrum.

Although the maze looks fairly good the Pacman somehow failed to convince. If you got caught by one of the ghosts the game pauses for an annoyingly long period.

There is also a sad lack of shrinking and gobbling sounds and the characteristic gulp, gulp, gulp, as you clock 200 then 400 and 800. An adequate game but far from exceptional, from **Abbex of London** at **£4.95.**

- **Getting started** 6
- **Value** 5
- **Playability** 4

Mazeman from **Abersoft** is a particularly fast version of Pacman. The speed improves the playability considerably — just as it does in the arcade original with quick responses.

One drawback with this version is that joysticks are not widely available as yet for the Spectrum and playing Pacman without a joystick is rather like Blackpool without the illuminations.

Again on the minus side the game from the Dyfed-based firm produced no sound effects, bonus fruits or flashing ghosts.

Despite my reservations Mazeman was a reasonable version at under **£5.00.** I found it difficult to walk away from!

- **Getting started** 8
- **Value** 6
- **Playability** 5

Cute comic character Hungry Horace adds the sparkle to the Psion software maze game for the Sinclair Spectrum.

In this episode he plays cat and mouse with the park attendants, stealing their sandwiches and eating their prize-winning daisies.

There is also an alarm bell which Horace just can't resist ringing, much to the annoyance of the park attendants.

The maze was a little bit on the simple side and a common problem with Spectrum games is the absence of a joystick — particularly acute with maze games — slightly detracted from my enjoyment.

With this one reservation my overall impression was of an amusing game with entertaining graphics and worth the **£5** price tag. It comes from Melbourne House originally but is sold by **Psion.**

- **Getting started** 9
- **Value** 8
- **Playability** 7

Spectrum Spectres adds a few novel twists to the maze race range of games available for the Sinclair Spectrum.

You play the part of Eddie the electrician lumbered with the unfortunate task of rewiring a mansion which is haunted by four ghosts.

You travel through the corridors placing light bulbs to score points. If you can touch one of the four generators in the maze you can then send the ghosts back to under the stairwell to score bonus points.

Once you have cleared a complete floor you can move upstairs to the next.

There is an added twist in that the generators only have a limited amount of energy which is shown in points at the top of the screen.

This is a most entertaining and colourful maze game with variety in the mazes and game play.

Spectrum Spectres is manufactured by **Bug Byte** at **£5.**

- **Getting started** 9
- **Value** 8
- **Playability** 7

ATOM

The ninth Atom games pack from **Acornsoft** rates as the best of the series.

The three games on the cassette, Snapper, Minotaur and Babies, use graphics and sound effects to the utmost, showing just what can be achieved on the Atom.

Snapper is a version of Pacman, simplified somewhat for the Atom. The changes include turning the ghost pursuers and the Snapper itself into circles (colour circles if you've got the colour encoder fitted) and some simplification of the rules — you don't get the fruit in this game.

When you have run over an energiser, Snapper's mouth falls open and he can then eat the ghosts until it shuts again.

There is only a few seconds of ghost eating time available to you.

The second game, Minotaur, has impressive graphics too. The object of this game is to take all the gold bars from the boxes scattered around the maze and put them in a safe while avoiding the Minotaur who is out to catch and eat you.

All this is done with 3-D pictures of the passages and various objects to be found in them. If you get completely lost, it's possible to call up a map of the labyrinth to show where everything is.

Another scheme for keeping track of events, is to mark the floor with a big cross so that you can remember where you've been. The game is difficult to win and ends when you have put all five bars in the safe or finished up on the Minotaur menu.

The sound effects in this game tell how far away the Minotaur is — he growls when he is getting close.

The third game on the tape is Babies, which has little to do with mazes. It is a close copy of the LCD watch game, in which babies jump out of a burning building and must be caught before they hit the ground.

The tape costs **£11.50.**

- **Getting started** 9
- **Value** 9
- **Playability** 8

TEXAS

The Wumpus lurks in his lair deep beneath the ground. In this labyrinth of caves he waits for the unwary to blunder in and present themselves as supper.

This cave dweller is so deadly that none who have ever entered his caves have ever escaped. He wolfs them down so quickly they never have a chance.

The Wumpus that dwells in the Texas Instruments TI 99/4a cartridge is pretty typical of the species.

The amazing thing is that there exists a breed of tough Wumpus hunters who still wander down into the depths and reckon to have a fair chance of killing the beast.

Their only chance is to fire a special corner-rounding arrow into the correct cave without actually entering it. As Wumpus hunters are only equipped with one arrow, they don't get a second chance.

Dots on the menu

Pacman may well be the last of the great craze arcade games after much mega-hits as Space Invaders, Asteroids, and Galaxians.

Greater competition and an ever increasing number of games releases has created a much greater variety in the arcades and few, if any, definable trends.

But there is an added dimension to the Pacman story. While the game was reaching fever pitch popularity in the US the home computer boom was also beginning to happen. The game was soon converted for the home computer and is now an essential part of the games players collection.

The game takes its name from the Japanese verb Paku — meaning to eat — which aptly describes the simple task of steering a yellow chappie around a maze — gobbling up dots, bonus fruits, and power pills as you go.

There are two types of computer maze game. Straight rip-offs of the Atari original and developments of the basic theme which add a number of original features.

Things to look for when buying a straight copy of the Pacman game are bonus fruits, an authentic and steadily accelerating movement of ghosts, multiplying bonus score for ghost gobbling, and an accurately shaped maze.

If your computer has joysticks then make sure your maze game works with them. And beware, playing Pacman without a joystick is rather like fishing without a rod.

If you opt for an original maze game avoid gimmicky graphics, but look for extra features which genuinely improve the playability of the game.

A choice of different mazes is a useful bonus as it is good fun developing strategies and working out the best routes.

EUGENE LACEY

This seemingly hopeless task can be achieved by the more logical amongst us as the Wumpus leaves clues to its whereabouts. In fact every cavern within two caves of his lair bears the taint of the creature.

By noting these, the player can often logically deduce the whereabouts of the creature.

Other hazards in this maze of caverns and passages include slime pits which offer death just as certainly as the Wumpus itself and a bat who bears grudges against those who disturb it.

This bat will suffer intruders once but, on entering his lair a second time, the player is grabbed and deposited elsewhere in the complex.

Among the different levels of the game, it is possible to attempt to track down the Wumpus in a particularly difficult and twisting series of tunnels. Or, the very brave may even elect to go Wumpus hunting blindfold.

A computer maze game with a long history, Wumpus brings the art of logical deduction to life but offers a pinch of luck which means that sometimes the odds are with the Wumpus. If you like working out mastermind problems, you'll probably enjoy Wumpus-hunting.

The cartridge costs **£19.35** from **Texas dealers.**

- **Getting started** 9
- **Value** 7
- **Playability** 8

BBC

Acornsoft seem to be undertaking a one-company campaign to prove that the BBC is the best games machine around.

They've proved their point to me. Snapper is a Pacman variation which is very close to the arcade game and every bit as playable.

Only keen arcade fans will notice the difference between Snapper and the original. It has a slightly different maze layout but the ghosts make life just as difficult around the new format.

Fruits follow the arcade pattern and the Snapper still has four corner energisers to run to in times of stress so he can turn the tables on his opponents.

The tunnel leading off-screen is also there and you have a high score facility as well as the usual catchy tunes. Marvellous arcade fare at **£9.95.**

- **Getting started** 7
- **Value** 8
- **Playability** 9

ATARI

Larry Bain is a plumber with the Rodent Rooster Plumbing Service who installs pipes throughout the levels of Rat Alley.

This is a maze race game of the Pacman type. Instead of ghosts you are chased by giant rats.

To keep down the rats you are supplied with two cats and two traps. Trouble is the cats are scared motionless and the traps only hold the rats for a few seconds. Although the cats will scare some of the rats there is a breed of super rats running around in this maze who will simply eat the cats.

Periodically replacement cats and traps are dropped in the centre of the maze and these must be picked up quickly before they disappear.

Once you have plumbed one maze completely, another maze commences with smarter rats.

It costs **£22.95** from **Gemini Electronics.**

- **Getting started** 8
- **Value** 8
- **Playability** 8

Atari Pacman is probably the most authentic arcade to home computer conversion ever made, rivalling Acornsoft's Snapper and Commodore's Jelly Monsters.

Books, records, T-shirts, telephones and even suspender belts have all been marketed in the US carrying a motif of the cute little yellow gobbler.

Computer gamesters need no introduction to Pacman but for the uninitiated it is a case of running around a maze gobbling wafers, bonus fruits, and power pills whilst dodging the four ghosts that are in hot pursuit.

Not to be played if you have an appointment. Pacman runs on an Atari 400 or 800 and is available in cartridge format from most Atari stockists at around the **£30** mark.

- **Getting started** 9
- **Value** 6
- **Playability** 9

VIC-20

With the disappearance of Bug Byte's excellent version of Pacman for the Vic 20 under the threat of legal action from Atari — the owners of the Pacman copyright — Puckman is one of the few authentic versions of the game left.

Puckman has all the principle features of the arcade game. The ghosts chase you through a maze full of dots which you must eat up as you go along. If you eat the power pills in the corners of the maze you can eat the ghosts.

Every so often a bunch of cherries appear in the centre of the maze which are worth a lot of extra points.

The graphics are surprisingly clear considering that the game is written for the unexpanded Vic.

My main criticism is that the Pacman is difficult to negotiate through the maze as the keys that move him tend to stick.

Once you press a key to move him he will continue in that direction even when you take your finger off the key.

Puckman is available from **Morris Associates** at **£5.50.**

- **Getting started** 8
- **Value** 7
- **Playability** 6

SPACE ATTACK

APPLE

Pilot the Starblazer on a mission to destroy enemy radar bases which are ruining your chances of a successful mission.

You can only bomb the bases from close range which is particularly difficult to do without crashing into the pylons.

Points are also awarded for bombing the radar out-buildings though you cannot fly on to the next part of the mission until you have destroyed all the radar dishes.

Once the radar installations have been destroyed the Starblazer zooms up to the top right hand corner of the screen and mission two flashes up the message "destroy supersonic tank". This, alas, is easier said than done.

First you must dodge or shoot a barrage of missiles which fly at you at great speed moving left to right across the screen. If you survive this lot you then attempt to divebomb the supersonic tank which — maddeningly — seems to be always out of your bombing range.

A most addictive "shoot 'em out" game.

Starblazer runs on an Apple II in 48K. It is available from **Software House** at **£19.**

- **Getting started** 9
- **Value** 7
- **Playability** 9

A dual sensation of flight and speed are the two key attractions in a new 3D-Apple space game from America called Zenith.

Your mission: defend the new space city which is being constructed to house the inhabitants of the old galaxy. The aliens are attacking. Spiralling towards you in colourful geometric shapes.

You wrestle with the joystick in an attempt to keep your ship steady, and get the aliens in your gun sights — as the chequered ground sways to and fro, zooming past beneath you.

Zenith is produced by the new American software house Gebelli.

The games impressive playability and superb graphics put it firmly in the highly recommended category with plenty of action.

It is available in this country from **SBD Software** at **£21.50.**

- **Getting started** 9
- **Value** 8
- **Playability** 8

The meteor storm

Science fiction buffs have explored the galaxies from the comfort of their armchairs for decades thanks to authors like Michael Moorcock, Arthur C. Clarke and Frank Herbert.

Now there is an even easier way to stretch your imagination out into the stars — through the medium of home computer space games.

You are now the space hero battling against evil forces intent on the destruction of the earth or event the universe. Pit your wits against alien beings with powers beyond imagination. In fact imagination is only limited to the type of program that you can obtain for your micro.

In this article we tell you some of the things to look out for when buying a computer space game.

Whatever type of micro you own, you may be sure that there will be a number of space programs to choose from.

Buying software by post means that you have to rely on advertisements when making your choice, but you can also choose from the ranks of cassettes on display in local computer shops. And don't forget that magazines, like *Computer and Video Games* publish games.

It is not possible to recommend a set type of space game program as many of the features are matters of individual choice.

Straight forward attack games in the Space Invader vein still have a lot of appeal and some of the latest versions based on this theme are excellent.

Programs are available to take you into the realms of space adventure where deduction, strategy, memory and planning are as much a requirement as quick finger on the fire button.

Micro versions of arcade games like Defender and Galaxians, to name but two from a vast selection, are fast, colourful, highly playable, and in some recent cases extremely authentic versions of their arcade counterparts.

With the advent of the new generation of low priced computers, high standards are expected with this type of program. So look for good presentation with clear instructions.

Where applicable the program should have high score facilities as well as good use of colour and sound. But the main points to look for are excitement and enjoyment without which the games will not hold you attention for long.

PAT NORRIS

SPECTRUM

For sheer frenetic action it's hard to beat conflict with the hordes of Winged Avenger from **Workforce.**

These outer-space fleets dive out of the sky, scattering bombs in all directions and challenging you to match their fearsome fire.

You are represented on the screen by a small laser base, with left and right controls plus fire and shield.

A timer ticks down from 500 and you have to get rid of wave after wave of aliens. This can be done in two ways, by shooting them or by running into them while they spend time on the ground.

Both are equally effective. But as the aliens have a tendency to swoop down at your position regularly, it is possible to build up quite a score by merely staying still and letting them crash against you — I have wiped out whole waves without touching the controls.

There are speed levels from a sedate 0 to a hectic 6 and the aliens come in three waves. First the small round variety, then as large green birds which can lose wings without being affected. And finally in a mothership which contains a fuel cell. If this is blasted successfully the timer resets and you can start all over again.

Guaranteed to give you an aching wrist, Winged Avenger, unfortunately, doesn't leave much scope for tactics. It costs **£6.95** for the ZX Spectrum.

- **Getting started** 8
- **Value** 6
- **Playability** 4

Arcadia is advertised as the "meanest shoot 'em up game ever" and it certainly does give you a wierd and wonderful assortment of aliens.

They attack in eleven waves of progressive difficulty and come in different shapes and sizes.

You can move from left to right across the bottom of the screen and also thrust forward.

The game makes good use of the Spectrum's colour capabilities but most importantly it lives up to the advertisement blurb and gives you a good addictive game of space attack.

Arcadia is produced by the new Liverpool software house **Imagine** and is also available for the unexpanded Vic 20. Both versions are available at **£5.50.**

- **Getting started** 8
- **Value** 8
- **Playability** 8

DRAGON

Dragon Games 2 features Snake, Lander and Space Invaders. All three are written in machine code. The first two use the highest resolution and so are in black and white — but this does not affect the quality.

Snake is similar to the arcade version. The aim is to gain as many points as possible by shooting the snakes. You move your man around the screen using the cursor keys. He fires when you press the space bar. An entertaining and addictive game.

Lander is another interpretation of an arcade game. It's a standard version which gives you the choice of two landing-pads — worth differing amounts of points. The cursor keys are used to control the craft — and this requires a lot of skill and practice. I found myself playing this game more than any other.

I could suggest a changing landscape as an improvement — otherwise it's an excellent adaptation.

Dragon users will be pleased to see the classic video game — Space Invaders — up and running on their micro. Being in machine code, movement of the alien invaders is smooth. Although not as good as Dragon Data's own version on ROM cartridge, it is better value for money.

From **J. Morrison Micros,** it costs **£5.95.**

- **Getting started** 9
- **Value** 9
- **Playability** 8

Enclosed with my copy of Dragon Trek, produced by Salamander Software for the Dragon 32, was a short letter containing the aims of the producers "to offer high quality professionally packaged software at a reasonable cost."

After a battle loading badly produced software from other companies I was sceptical about this claim. However, I am very pleased to say that my fears were unfounded. In fact I think Salamander surpassed their aim.

Dragon Trek came attractively packaged with comprehensive instructions

in a thorough 16-page flight manual.

This is a real time version featuring full colour tactical status and long range scanner displays, hyperprobes, tractor beams and Klingons. A lot of work has gone into producing this tape!

The various displays are all well designed and arranged — easy to read and understand.

The aim of the game, of course, is to wipe out the Klingon fleet. Using various keys you can call on your long range scanner, call up a damage report, go into warp drive, or send your hyperprobe on ahead of the Enterprise to see what's going on.

On challenging a Klingon you can activate your defence screen and choose your weapons — phasers or photon torpedoes. Phaser fire is controlled by your on-board computer and you direct a torpedo using your joystick.

When energy is running low docking with a starbase will recharge them and replenish your weapons.

Black holes and supernovas add extra hazards as you journey where no man has gone before.

I find it difficult to fault this tape, but perhaps the explosions of Klingon ships could be a bit more dynamic.

Excellent presentation along with good use of the Dragon's facilities left me thinking — why can't all software come up to this standard!

At only £6.95 order your copy now — before they sell out! Sorry I have to go, my crew needs me ....

- **Getting started** 9
- **Value** 9
- **Playability** 10

BBC

As close a copy of the brilliant arcade game of Defender as you are going to get on a home computer.

That's **Acornsoft's** Planetoids which runs on the BBC Model B. If anything, it is slightly faster than the arcade original.

You have the scanner on the top of the screen to show the entire planet surface, so sneaky landers can't grab humanoids away from the main action without your knowing. The aliens and the sound effects are faithfully reproduced and all the usual controls are there.

These seven necessary keys to control your craft take some getting used to and in moments of extreme panic I still find my fingers thudding down on quite useless parts of the keyboard, but that is part of the skill of the game.

If you are a keen Defender fan from way back (about 1980) and are still unconvinced that the detail can be as close as I've outlined, let me assure you.

The third wave often finds all three pods in smart-bombing position on the screen and the programmer has even included Swarmer "bleed" should you slightly miscalculate on this tactic. Marvellous entertainment and pure addiction at **£9.95.**

- **Getting started** 8
- **Value** 10
- **Playability** 10

ZX81

Invasion Force is an original and addictive game from **Artic Computing** of Hull. You are under attack from an alien command ship with a fleet of bombers which form the advance wave.

Below the ships is a wall, constantly moving from right to left obscuring your line of fire.

Your mission is to destroy as many bombers as possible, earning 1000 points for each one downed. Ultimately you will have to gun for the base itself but this is pretty well impossible.

There are two levels of play — which is a bit of a minus as I would have preferred a third faster level.

My only other criticism is that after each game you must go back to the instructions. It would be better if you could simply press a key to continue.

Despite these drawbacks my overall impression was one of an enjoyable addictive game. It costs **£3.95.**

- **Getting started** 9
- **Value** 6
- **Playability** 7

ATARI

Moonbase Io — pronounced eye-oh — is an arcade-style space game. It is actually a combination of three games — inspired by the recent flights of Voyager 2 to Jupiter.

The "Io" in the game's title refers to one of the four major moons of the solar system's largest planet. Since Jupiter was discovered to be a large mass of inhospitable liquids and gasses, unsuitable for landings.

This game uses the moons Io, Europa and Ganymede as moonbases for your spaceship. This choice of bases, however, has upset the local bug-eyed population and they are determined to send you back where you came from or destroy you in the attempt. The aliens launch swarms of ships to battle against your probe.

One particularly outstanding feature of this game is the synchronisation of the graphics with a soundtrack on a separate voice recorder. This gives you a full briefing from Cape Canaveral the first time the game is played.

There was a slight snag here though. It was not always easy to synchronise the voice tape with the play tape.

Moonbase Io provides a fast machine code game with player-missile graphics, redefined character sets, fine scrolling and impressive sound effects.

The game has three phases. To secure each of the three moonbases, the player must pass a docking phase — impeded by swarms of aliens and the nearby moon — and if successful, transport to the surface of each moon for a phase which involves defending the base against more formations of aliens.

In addition there are seven skill levels — from novice to galactic wizard — with variations in scoring and reserve ships. Some hidden features are also promised, although I never managed to survive long enough to experience them.

Moonbase Io runs on an Atari 400 or 800 in 16K and requires a joystick controler and can be obtained from **Centresoft** at **£24.95.**

- **Getting started** 6
- **Value** 6
- **Playability** 8

PET

A space mayday message brings a swift response from your mothership in Space Rescue.

Five spherical life support pods are stranded on hazardous alien terrain in this Pet game and your job is to bring them safely aboard the ship.

Out of the rescue hatch goes the ship's recovery shuttle which is controlled by means of the Pet's keypad. The shuttle is released by pressing a "2" to move it planetwards and from this moment your score increases by one for every second you survive.

To rescue a pod, the shuttle must be positioned immediately above it, and the "A" key pressed. This manoeuvre can be difficult on the higher skill levels since the shuttle moves quickly but the control key is responsive.

Next, the shuttle should be guided to a position just above the mothership and the pod dropped through the rescue hatch by pressing "D". If you miss the pod drops back to the planet surface.

On saving all five pods, you are invited to dock with the mothership for a bonus of 500 points and then it's on to the next skill level to try and repeat your hard-earned rescue.

Supersoft has succeeded in creating another addictive game purely because it is so hard to master. It costs **£8.**

- **Getting started** 5
- **Value** 7
- **Playability** 9

NOVELTY GAMES

BBC

Can you throw the switch that stops the robot before he blasts you? That's the challenge issued by **Viking Software** of Bournemouth on their latest tape for the BBC B — oddly enough called Robot!

You control a little man being shot at by a big robot. Unfair, I hear you shout. The little man can save himself by dodging the robot until he gets to the bottom of the screen where there's an OFF switch which will immobilise the metal monster.

This is an addictive game — although it's a bit slow having been written in Basic. It costs **£4.95.**

- **Getting started** 7
- **Value** 7
- **Playability** 7

APPLE

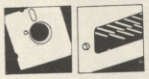
A belligerent old soldier refuses to leave his wartime enclave high in the Cannon Blitz Hills.

For him the war still rages and he will shower anyone who passes below with cannon balls. You must dodge the cannon balls and escape to the next level where a balloon is waiting to carry you safely out of range.

At the third level of this game you have to jump from platforms onto a moving escalator which takes your little man to the top of the hill where he can deal with the old soldier.

A game of impressive graphics with obvious associations with the popular arcade game Donkey Kong. Cannon Ball Blitz is available from **Spider Software** at **£19.95** on disc for the Apple II.

- **Getting started** 9
- **Value** 6
- **Playability** 6



ATARI

Pogoman will make you jump with joy. The idea of the game is to make Pogoman jump up and put out the street lights. Points are awarded for each lamp blacked out.

Move the joystick slightly to the right and Pogoman will do a little bunny hop. Pull the joystick down and you add height to his jump — push up and you stretch him further.

As Pogoman moves down the street past trees, office blocks and parked cars a number of obstacles appear in the road in front of him. All these must be jumped over in order for him to continue.

The further he gets the more difficult the obstacles become. A bird swoops down from the sky to try to knock Pogoman off his stick.

There is also a guard who rushes out from the right hand side of the screen to knock Pogoman down. Pogoman runs on Atari 400 or 800 with versions available on disc or cassette.

It is imported into the UK by **Calisto Computers** of Birmingham and sells at around **£20.**

- **Getting started** 9
- **Value** 6
- **Playability** 8

Those crazy Duke Boys have been making moonshine again and gunning the souped-up General Lee around Hazard County leaving the sheriff in a spin.

This game turns reckless driving into an indoor pursuit.

You are at the wheel of the souped-up Chevvy as you drive through farmyards, lanes and twisting country roads.

The sheriff is on your tail and you will need to drive smartly to give him the slip or make a spectacular leap across the river and watch his car nosedive into the water as he tries to follow you.

Hazard Run is based on the popular American TV programme the Dukes of Hazard.

The game is available from **Allrian** of Middlesex, running on the Atari 400 and 800 and retailing at **£21.50** for cassette and **£24.95** for disc.

A good novelty game if a little pricey. But it does allow you to relive the TV series.

- **Getting started** 7
- **Value** 5
- **Playability** 6

VIC-20

Shadowfax brings one of the most exciting chapters of *Lord of the Rings* to the screens of your Vic computer.

The game takes its name from Gandalf's horse — the swiftest beast in Middle Earth.

This is your chance to ride Shadowfax as you gallop against the Black Riders of Sauron — the Dark Lord of Mordor.

The idea of the game is to shoot as many of the advancing Black Riders as possible. To kill the Riders you must release a thunderbolt by pressing the shift key. Quickly release the key when the bolt is centred on a Black Rider — this will explode the bolt — killing the Rider — which then glows red and disappears.

If you fail to release the key quickly enough the bolt will pass through your target and leave him unharmed.

The graphics are most convincing — particularly the galloping motion of the horses.

A highly original and addictive game. Shadowfax is available from **Postern Limited** of Cheltenham at **£9.00.**

- **Getting started** 8
- **Value** 8
- **Playability** 8

Hopper is Frogger with a whole lot of differences. The game has undergone some **Rabbit Software** replanning on its way into 3.5K of memory for the Vic-20.

You still command a hopping creature and it still has to get over a busy road and across a log-filled river to one of five bases in a bank to score, but there the similarities end.

This poor amphibian also needs to negotiate parked cars on either side of the road, he has to avoid houses on a grassy verge in the middle of his adventure and finally he has to **swim** the river **avoiding** the brown logs!

All this and a quickly counting down time limit serve to make the game more difficult than the arcade original, but not as enjoyable.

Hopper is rescued by some very suitable sound effects which sploodge him around the screen with such an air of dampness you feel he's leaving a soggy trail behind him.

The parked cars and houses are immobile, so add little to the game, five streams of traffic on the road are easily crossed with the two lanes of brown speeders being quite infrequent.

This leaves the river, which is where the difficulties start. It's seldom that a free white route leading to a home base becomes visible in the brown murk. When it does it's usually closed before you get across. So you're left hopping between the logs enclosed on all sides hoping a white space will appear above you.

But this tactic falls down as you are not allowed to hop along the bank at the end to a home base.

Hopper costs **£9.99.**

- **Getting started** 9
- **Value** 5
- **Playability** 4

Cute is crucial

The video games business in America has until quite recently been referred to as the recession proof industry.

Its astonishing growth over the last few years has been due in large part to the wizardry and imagination of the games designers.

As well as the ubiquitous "shoot-'em-up" space games we have had exciting adventure games like Tutankham and Space Dungeon and more recently sheer fantasy with Donkey Kong and Pengo.

Most computer gamesters will be familiar with Donkey Kong and Frogger and versions based on these novelty games are now available for most of the popular micros.

There is no need to restrict your purchases to straight copies of arcade hits. There are no rules for novelty games. The only restriction is the breadth of imagination on the part of the programmers and game designers.

Despite this there are some common elements which you should look out for which will collectively contribute to a good game.

Good graphics are by definition crucial to the success of novelty games. The characters must be cute or plausible, well defined, and above all central to the general theme of the game.

Sound effects can often make or break novelty games. Some of the new arcade machines excel here, such as Pengo for example, with a trio of tap dancing baby penguins who do a little number for you if you get a sufficiently high score. Your home computer will not be able to provide a song and dance routine but providing the program is a good one, it should be able to produce some impressive sound effects, and this is definitely something to look for when making your purchase.

Graphics, sound, and plot are all important elements of a good novelty game but they can never compensate for a game that basically is not playable. Look for that little twist in a game which will keep you coming back for more.

EUGENE LACEY

Firing to escape

Who can resist blowing up asteroids? To have them careering about in the privacy of your own home is sheer ecstacy!

But what flavour do you prefer? This game has been multiplying at an alarming rate and with so many about how do you choose?

The first consideration must surely be how fast, there is little point getting either a game that is so slow that it bores you to death or so fast you find it unplayable.

Next consider the controls you are offered, rotate left, rotate right and fire are universal but what of hyperspace and thrust? Is the thrust of the move stop variety or a true inertial thrust (turn round and thrust to stop yourself moving).

Then you may consider features: How many sizes of rock do you get? Two, three or more? How many saucers do you get, do they fire at you? Have you a wrap around screen? What does the game look like? Does it have hi-res graphics, colour?

Does it have different attack waves (more rocks each wave)? Does the game have an attract mode, full scoring, high score, bonus ship?

Finally, does the game have any special features such as particularly outstanding graphics, sound or speech?

A game that has most of the above features is likely to be fairly close to the arcade original and give you hours of entertainment.

MARK EYLES

DRAGON

Software for the Dragon 32 is gradually becoming available and arcade fans with one of these new microcomputers will be pleased to see two versions of video game favourites for their machine.

Meteor Run — a version of arcade asteroids — and Breakout are two games on a tape titled Arcade Action produced by **Apex Trading** of Brighton.

Loading instructions were supplied on a sheet of computer printout paper. The instructions were short and precise, but the packaging was poor.

The cassette interface of the Dragon has always proved reliable but loading these games turned out to be a long struggle. Breakout defeated this reviewer — and on listening to the recording I found it to be really quiet.

Meteor Run was also a struggle to load — it's a pity it wasn't worth the effort. It is a short program written in Basic. You control a space craft — using the left and right cursor keys — while dodging meteors represented by red graphic blocks. You have to shoot enemy ships using the space bar to fire your laser.

It held my attention for all of two minutes — but being in Basic it can be listed and may be helpful to beginners.

All in all this was a very disappointing package — one not worth the **£4.95** price tag.

- **Getting started** 2
- **Value** 4
- **Playability** 3

ZX81

Electric Pencil Company's version of Asteroids for the ZX81 is the best I have played. It has superb instructions, it is fast, has great graphics and good game options.

The spaceship was cleverly represented by either an 'A', 'V', 'D' or 'C'. Block symbols from keys Q, W, E and R were used for 45 degree angles.

There are four sizes of Asteroids and these were just about right. Their speed varied during the game — getting progressively faster.

The game has five speed levels. Level 3 should satisfy all but those of you who score a billion points for 20p.

There is an option for doubles or singles and the five top scores and names can be displayed.

A great game for one or more players, this version of Asteroids is manufactured by the **Electric Pencil Company** at **£3.95.**

- **Getting started** 8
- **Value** 8
- **Playability** 9

Quicksilva Asteroids for the ZX81 got off to a bad start as it did not supply any game play instructions.

After a lengthy process of key fumbling I managed to locate the correct controls and played a fairly average game.

There were no alien saucers to shoot at for bonus points and the asteroids themselves were just clusters of 'O's.

I found it difficult to tell which way I was facing as the ship is represented by a number from 1-8 — depending on which way you're facing. It will take you some time to master the controls.

Responses are fairly fast and you can turn clockwise (7 or 4), anti-clockwise (5 or 6), fire (1 or 0) and to thrust forward (2 or 8).

Flash packaging fails to rescue a particularly mediocre version of this hit arcade game. It costs **£3.95.**

- **Getting started** 2
- **Value** 5
- **Playability** 5

BBC

Asteroid Belt is a version of the popular arcade game asteroids for the BBC model B.

Armed with a photon cannon, your mission is to destroy the oncoming onslaught of rocks before they collide with your ship.

The larger asteroids split into two when hit to the sound of a satisfying rumbling noise. These may be, in their turn, split to become two small asteroids which, if hit again, will become cosmic dust.

You have a hyperspace button which will make you momentarily disappear and then randomly replace you somewhere on the screen.

The game is reasonably fast with adequate sound effects.

On the minus side the operating keys were ridiculously far apart and the ship would not turn quickly enough.

A reasonable game but not without a few flaws. From **Computer Concepts** for **£8.97.**

- **Getting started** 7
- **Value** 4
- **Playability** 4

SPECTRUM

Meteor Storm is a close copy of arcade asteroids for the Sinclair Spectrum.

The asteroids were represented as geometrical line drawings drifting weightlessly towards your ship.

The game displayed clear instructions on the screen and also showed you the value of the various asteroids and flying saucers on the screen.

The game kept a running total of the high score and also allowed you to enter the initials of the top 10 high scores of the session on a hall of fame chart — in true arcade style.

You are also provided with a keyboard overlay which, although it seems just like a gimmick, is actually quite useful in Asteroids where you have five controls to concentrate on.

A most playable and authentic version of the hit arcade game.

The game runs on the Spectrum and is available from **Quicksilva** at **£4.95.**

- **Getting started** 5
- **Value** 7
- **Playability** 8

Official Sinclair writers **Psion** have entered the battle for Spectrum asteroids with Planetoids.

This game is not quite so close to the arcade original as the Quicksilva version though it is none the less impressive for this.

The game has an excellent fire mechanism — the missiles could be fired in quick succession and reached their targets swiftly. The game had the essential five features — rotate right, rotate left, fire, thrust and hyperspace.

This version also includes the missile-spraying UFOs which really add spice to an Asteroids screen and usually warrant a torrent of abuse after one of their more successful excursions.

One drawback was the lack of inertia on the thrust button. This makes the game slightly easier to play but would upset the purists who want to play arcade Asteroids on their own TV sets.

Despite this one reservation, the game plays pretty good Asteroids and is a more than reasonable piece of software for **£5.95.**

- **Getting started** 5
- **Value** 6
- **Playability** 7

Softek Meteoroids is the third and final version of asteroids we tested.

It too offers most of the features we have come to expect from the arcade original.

However the **Softek** programmers have also tried to get away from the usual asteroid design of craggy white outline and little else inside. The Softek version features an admirable attempt to simulate the rock-like texture of asteroids.

This version has been written to work with some of the new Spectrum joysticks. An adequate game of Asteroids.

- **Getting started** 5
- **Value** 5
- **Playability** 6

SCRAMBLE

APPLE

Choplifter is the top selling game in the US for the Apple computer.

Superb graphics and superior game play have shot it to the top of the charts.

You play the part of a helicopter pilot on a mission to rescue hostages trapped inside enemy barracks deep inside hostile territory.

Each time you rescue a hostage the computer emits a high-pitched bleep telling you that the hostage is safely aboard.

You can only carry 16 hostages without overloading the chopper so you will have to make more than one sortie into enemy territory.

The number of hostages rescued and tanks destroyed is recorded at the top of the screen.

The game is best played with joysticks although this reviewer played quite an interesting game using paddles. The helicopter can fly backwards, forwards and sideways – leaning into a dive most realistically. it is also quite difficult to control and will take you some time to master just as a real helicopter would.

A most addictive game and easy to see why it did so well across the Atlantic.

The game is available from **S.B.D. Software** and costs **£19.95.**

- **Getting started** 9
- **Value** 7
- **Playability** 8

ZX81

Take up the Gauntlet and tackle a thrilling subterranean Scramble challenge for the ZX81.

The object of the game is to fight your way through fortified caves with bombs and a laser gun. You start with three craft and get one more every 6,000 points. These are controlled by: "Q" key for up and back; "W" for up and forward; "A" down and back; "S" down and forward.

"B" and "M" give you control over your guns and bombs, and the game is quite easy to get to grips with.

You are actively encouraged to make a copy of the game but that hardly proved necessary as the game loaded every time and the instructions are also very clear.

The first part of the game leaves you in the open, then you enter the caverns and take on some aliens. In stage three you encounter the meteors and level four has only a narrow channel to fly down. That was as far as I got (8,300 points if you want to try and beat it).

In all there are six phases to the game which requires a 16K Rampack and costs **£3.95** from **Colourmatic.**

- **Getting started** 9
- **Value** 8
- **Playability** 9

VIC-20

Vic Skramble from **Terminal Software** is a miracle of memory conservation. How it ever came to be crammed into the unexpanded Vic's 3.5K is a mystery to me.

The Vic's clear graphics are used to good effect with helicopters, planes, oil tanks and missiles all convincing. My main quibble was that this game could not be played by joystick but with one control more than the average joystick can handle, that is perhaps understandable.

As it is, the flight control keys: fast, slow, the crucial up and down, are in the "+" position and take a lot of getting used to. The other controls are laser and bomb.

You are faced with eight challenges in this thrilling and addictive game. First travel overland, bombing as much fuel as you can to keep energy up, blasting missiles and helicopters on the mountain ranges.

In stage two the missiles fire back launching into the air, stage three takes place in the Wiggy tunnel and that's where I met most of my destructions. Stage four is set in the cavern, stage five on the meteor trail, stage six takes you over Rocket City, stage seven offers the dreaded city maze and finally a homing shot makes up the final challenge.

A very valid attempt to reconstruct the arcade original. It costs **£7.95**. One bug though, a mistaken "shift" combined with "CTRL" (all too easy considering the controls) and the game wanders into the murk of switched character sets.

- **Getting started** 6
- **Value** 8
- **Playability** 8

SPECTRUM

Penetrator is my pick of Scramble-type games for the Spectrum.

It succeeds in being immensely playable yet very difficult and horribly addictive.

Nice touches include a large number of radar scanners which constantly rotate as you fly over them. These are worth more than points, for unless you blow them up, they collect data about your flight plan and enable missiles and enemy paratroopers to track you more successfully.

This is shown in a danger level indicator on your console. The more radar scanners left operative the more likely the missiles are to blow you from the sky. There is only one way to reduce the danger level, blowing up the enemy's neutron bomb store. Four stages to the game before you meet the neutron bomb HQ and try to return to base.

Your controls are very responsive – they need to be – up, down, thrust, brake, fire and bomb.

There has been a lot of careful thought gone into the way the controls work. Thrust and fire are on the same key but operate independently and the whole bottom row of the Spectrum keyboard is given over to bomb.

You can customise your own Penetrator maze. The game allows you to build up your own scenario with radar installations, missiles, caverns and steep hillsides. But it is a time consuming exercise so it's well worth saving the finished product.

In view of all this effort on the part of the marvellous **Melbourne House** programmers, it's a pity they didn't curb their keenness for presentation techniques a little.

The firing rockets and slow writing out of "Penetrator" is pleasant the first time but pales a little when you are keen to get on with the game and improve your score.

But this is my only criticism of a well-conceived piece of software.

It runs on the 48K model and costs **£6.95.**

- **Getting started** 9
- **Value** 10
- **Playability** 9

ATARI

Airstrike is a very well executed derivative of the popular arcade game Scramble.

The object of the game is to pilot your spaceship through underground caverns while avoiding numerous obstacles that are placed in your flight path.

The first obstacles to be overcome are surface-to-air missiles and the occasional floating mine. On you way through this part of the cavern you pick up more ammunition and fuel. In the second part of the cavern you may have to deal with a whole series of floating mines.

Once through this part you come across a series of airlocks. The only way to get past these is to shoot the middle out of them and manoeuvre your craft through the resulting hole. You may also encounter the occasional enemy fighter who will try to shoot you down.

Each level has a different colour and your craft carries less ammunition due to the higher gravity.

This really is a most impressive game and the English Software Company are to be congratulated.

Airstrike is available from **Gemini Electronics** at **£19.95.** The game runs on an Atari 400 and 800 in 16K with a disc version also available.

- **Getting started** 8
- **Value** 8
- **Playability** 8

One way travel

Scramble was one of the hit games of the post Space Invaders boom and still hangs on stubbornly to its prime positions in arcades, pubs and motorway services.

Its addictiveness is due to the challenge it sets you to get further. It's not how much you score that concerns the Scramble fan so much as how far he can get. Can you get beyond the yellow zig-zaggers, or the red fireballs? Or have you got into the maze yet, and if so how far have you got into it? Ultimately, have you shot the robot? This is the supreme test for Scramble aces who have successfully piloted their craft through the preliminary levels.

Any computerised version of this popular arcade game should recreate this graded level of difficulty. This can be achieved by varying the speed of the attacking aliens or the difficulty of the scrolling terrain to be flown over. There must also be some final adversary like the robot in the arcade version. It is crucial to be able to move backwards and forwards as well as up and down. Scramble can only really be enjoyed with a joystick. A good version will enable you to bomb and shoot at the same time.

EUGENE LACY

FLIGHT SIMULATION

ATARI

If you have ever wondered what it feels like to be at the controls of a 747 thundering across the Atlantic with a plane full of passengers then wonder no more and give it a try.

Jumbo Jet Pilot challenges you to take off, fly to a selected destination and touch the plane down safely again. Sounds easy? Well just you give it a try.

There are nine different dials to keep a constant eye on. Altitude, compass, artificial horizon, pressure gauges, and the instrument landing system — all authentic flight controls.

The game gives you two screen presentations — the view from the cockpit with dials, and a map showing the layout of the airport and your destination.

To begin you have to taxi the plane out on to the runway and then build up speed fo the take-off. The sound effects are quite impressive during this part of the game as the roar of the engines build up when the plane gathers speed.

My main criticism of the game is that it is rather slow. Once you have successfully taken off and correctly set the bearings for the flight you could almost go and make a cup of tea. It was just like switching onto automatic pilot, which may be realistic, but personally I also found it a little boring.

Again on the minus side, if you crash the plane you must go right back to the beginning, taxi out and take off all over again. It would have been better if you could resume where you left off or at least if it had a final approach option.

An impressive piece of programming but I feel I could do better for my money.

Jumbo Jet Pilot runs on Atari 400 or 800 and is manufactured by **Thorn EMI** and available from Spectrum computer shops at **£34.44.**

- **Getting started** 9
- **Value** 5
- **Playability** 5

SPECTRUM

The instrument panel comes into its own in Night Flight, because there's not much else to see out of the windscreen, it's all pitch black.

In **Hewson Consultants** version of flight simulation you are faced with the problem of landing a light aircraft in the night. The screen is divided into two with the bottom half being taken up by instrument readings, while the top half is given over to the view from the cockpit. This remains dark until the landing strip lights come into view.

A very simplistic map shows the world outside as consisting of a range of hills right across the screen at a height of 1,650 feet with one small valley to the west of the runway which itself runs east-west.

Above 2,200 feet the airspace is very congested and there is a high risk of collision.

Apart from the map there are six modes to try out: mode 0 is a demo shown over the last 2½ miles of a successful approach; mode 1 leaves you nine miles from touchdown heading west; mode 2 is the same heading east; mode 3 leaves you heading north and mode 4 asks you to take off first. The final mode is on autopilot and shows you how it should be done but allows you to take over at any time.

As in most simulations there is a wealth of controls and things to consider and it is initially very confusing.

Raising and lowering the airplane's nose, checking on engine rpm, banking, lowering flaps and landing gear while checking constantly on your heading against the directional beacons, airspeed, altitude and fuel.

Still it is hardly the most complex of simulations and the night idea does give an excuse to bring the necessary memory down to 16K. It costs **£5.95.**

- **Getting started** 8
- **Value** 7
- **Playability** 7

Many of the features of **Psion's** Spectrum flight simulation are straight out of the cockpit of a Boeing 747.

All information systems are displayed as dials just as in a real plane. These tell you your altitude, rate of climb, speed, wind and weather conditions, and your position.

The program gives you two screen presentations. The first of these shows the view from the cockpit with the instruments described above in the lower half of the screen and the view of the horizon in the top.

The plane can be made to bank, roll, dive, climb and even loop the loop — though you will have to be a pretty good pilot to make it do this.

The second screen presentation shows a map with your plane flashing its rate or progress towards your chosen destination. The airports are represented as flashing beacons with the land and lakes shown.

A masterful piece of programming and undoubtedly one of the best flight simulations yet to be produced for a micro.

Flight Simulation runs on a Spectrum in 48K and is available from larger branches of W. H. Smith at **£7.95.**

- **Getting started** 9
- **Value** 9
- **Playability** 8

ZX81

Flight Simulation is one of the best programs I have ever seen for the Sinclair ZX81.

After loading, which takes about six minutes, the program runs a check to see if it has loaded correctly. If it has you may proceed, if not, reload.

The program places you in the pilot's seat of a twin-engined propeller plane searching for the airport beacons in poor visibility.

The game gives you three screen presentations. The view of the horizon as seen from the cockpit. A map of the Mediterranean with landing beacons and the position of your aircraft. Towards your final approach you can also request a visual display of the runway and landing lights.

Newcomers to the game can start off by just playing the final approach part of the game. It is a tough test of your skill and it will take you several attempts to touch down safely. More experienced pilots can select a number of extra difficulty features such as 'wind effects' and 'full feature'.

When in the cockpit display the top half of the screen shows a view of the cockpit windows where you will see the horizon formed by the sky and the ground. As the altitude of the plane changes, so the visual horizon will move to display the effects of banking, diving and climbing.

Flight Simulation runs on a ZX81 and is available from **Psion's** W. H. Smith outlets for **£9.95.**

- **Getting started** 8
- **Value** 9
- **Playability** 9

Realistic training

Commercial flight simulators are used in the training of airline pilots and are now so good that they provide a genuinely realistic simulation of flying in a jet.

These simulators use large computer systems and cost anything from a few million pounds upwards, but a more modest range of flight simulation programs for the home computer are now becoming available in the price range £5 to £50!

As with all software, paying a higher price will not necessarily buy you a higher quality program. Here are a few features to look for.

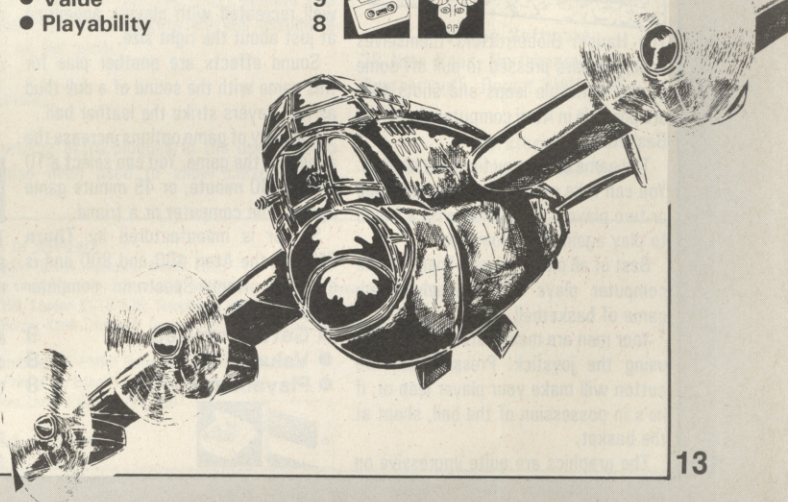
The most technically difficult component of a flight simulator is the representation of the outside world. This should include at least the horizon and a representation of a runway — any additional features are a bonus.

Landing a plane on a runway is the most exciting part of flight simulators and it is important that this part is done as well as possible.

Home computers are not capable of displaying a real instrument panel but it is possible to create an impression of a vast number of gauges and dials which give the feel of a real cockpit. Analog displays like gauges and dials in addition to digital displays are more authentic, interesting and easier to read.

Landing a plane safely is one of the most difficult tasks the pilot has to perform and this should be accordingly difficult and instructive in a flight simulation.

CHARLES DAVIES



VIC-20

Alien Soccer is probably going to surprise most of its purchasers.

The program for the Vic-20 claims to be "The wierdest game of soccer you've ever played". It lives up to that claim but not in the way the player would hope, being more reminiscent of pinball than football.

The aliens are there all right, two blue ones on your side set about a goal's width apart and four green ones facing you on the far side of the screen.

On the pitch itself are five large pink creatures which are unmovable and act much in the same way as bumpers on a pintable.

A ball is served up, flicked on usually by the two sets of green invaders as they bounce up and down between the top and bottom of the screen, then bounces into the large pink variety flinging about before heading it out towards your side of the screen which must be protected by your own two aliens.

Send it back if you can, I certainly found it hard to use my two defenders to good effect and the game was over within seconds as a rule. There are five skill levels but level five looked impossible and level one was quite hard enough.

After a while leaping invaders appear on the screen creating further havoc.

The good breakout or pong player may enjoy the game but it was beyond me and the title is sadly misleading.

It costs **£9.99** from **Rabbit Software.**

- **Getting started** 7
- **Value** 3
- **Playability** 4

ATARI

The Harlem Globetrotters themselves would be hard pressed to pull off some of the incredible leaps and shots that are possible in Atari computer simulated Basketball.

The game offers you five play options. You can take on the computer with one or two players or team up with a friend to play against the computer.

Best of all play against a friend as the computer plays an extremely tough game of basketball.

Your men are moved around the court using the joystick. Pressing the fire button will make your player leap or, if he's in possession of the ball, shoot at the basket.

The graphics are quite impressive on this game — the men's limbs move and the ball moves across court in slow arcs to give the impression of depth.

Basketball runs on Atari 400 and 800 and comes out of **Atari** catalogue in cartridge form or from Spectrum computer shops at **£24.99.**

- **Getting started** 9
- **Value** 6
- **Playability** 6

Score the winner in the FA Cup final with this latest soccer simulation game and a little bit of imagination.

You control up to four players moving them around the pitch with the joystick and depressing the fire button to shoot.

Up to four players can be moved at any time — the player possessing the ball dictates which of the eleven players in the team can be moved.

The depth and scale of the pitch are well recreated with players appearing at just about the right size.

Sound effects are another plus for this game with the sound of a dull thud as the players strike the leather ball.

A variety of game options increase the appeal of the game. You can select a 10 minute, 30 minute, or 45 minute game against the computer or a friend.

Soccer is manufactured by **Thorn EMI** for the Atari 400 and 800 and is available from Spectrum computer shops at **£29.84.**

- **Getting started** 9
- **Value** 8
- **Playability** 8

Artful animations

Most computers acquire a library of sports simulations after they have been around for some time.

The Atari now has several sports titles from standard soccer and basketball type games to more unlikely indoor sports such as darts and snooker.

Graphics are important in sports simulations. Look for accurately marked pitches, thoughtful scaling, and authentic movements of the ball.

In games that involve a lot of running, look for authentic simulation of the running motion of the players. Nothing is more ridiculous than a player moving around a sports field without moving his legs.

Of course, computers are not yet sophisticated enough to reproduce all the elements of a game on a TV screen but they are easily capable of giving an enjoyable game if the cartridge has been well thought out.

It should have two player options and also the facility to play against the computer when your friend is not around.

The two player option if it is to be really effective should allow for simultaneous participation by two players.

Finally, sound effects are also important in sports simulations. Check to make sure the computer produces some audible signal whenever the ball is struck or kicked and also when a goal or point is scored. Some of the better sports simulations have authentic sounding effects such as a leather ball being kicked, or the sliding of skis, even the cheering of the crowd has been incorporated in some games.

All these things help to make a good game. The golden rule, however, as with buying all computer games, is to play them first whenever possible.

EUGENE LACEY

About the only thing missing from **Thorn EMI's** darts program is the TV commentator's shriek of, "Wun-hundred-and-eightyyy!"

The game, for the Atari 400/800, takes place inside a public house with a keen, and rather slim-looking, darts player standing a regulation distance away from his board.

When the game is in play, the marvellous graphics are added to by a close-up of the board itself in the bottom right hand side of the screen with a hand hovering close by.

An eye-catching feature of this game is the sound effects which, if you hit a wire and bounce out, respond with a realistic chink and thud.

You begin play by selecting a game from 301 to 901 and choosing a skill level between 0 and 9. The hand holding the dart hovers over the board and you have to judge carefully when to fire as the finger tip hits the part you think you need.

Darts costs **£19.95,** expensive for a cassette despite the good packaging.

- **Getting started** 9
- **Value** 5
- **Playability** 9

TT Racer brings you all the thrills and spills of the Isle of Man super-bike races.

The game challenges you to race against the clock and see how far you can get along an obstacle filled race track.

Push your joystick forward to accelerate — but not too far or you will crash straight into the crowd losing time.

The track scrolls down the screen as you are shown an aerial view — including rooftops and trees. The track becomes increasingly more difficult.

The sound effects are an impressive element of this game. The acceleration sounds are particularly convincing.

The first major obstacle you must negotiate is a fork junction with an oil slick on one side and clear track on the other. You must make a quick decision on your course and then accelerate away before the slick switches back under your tyres!

Once through this you will have to steer over narrow bridges, wait at traffic lights, and dodge in and out of square green obstacles.

When a minute has elapsed the game ends and you are given a score read-out based on how far you got.

TT Racer is the first of a range of sports simulations for Atari 400 and 800 from **Centaursoft** at **£19.95. £19.95.**

- **Getting started** 8
- **Value** 5
- **Playability** 7

SPECTRUM

If you like pretty pretty graphics then Horace Goes Skiing may be just the game for you.

The cute comic book character was first introduced to Spectrum owners last year when Psion Software launched their Hungry Horace game. In that episode the mischievous little gobbler ate the park attendant's sandwiches and prize winning daisies.

The game begins with Horace attempting to get across a busy road as lorries, vans and cars thunder by. You must get him to the other side of the road without getting him killed. You have three lives in which to do this.

Once he is safely across the road he can pick up his skis from his shed, put them on, hobble back across the road and then begin his attempt on the slalom.

The first few flags are widely spaced and can be taken nice and gently. The game gets progressively difficult.

Splendid graphics, an addictive game, and a lovable character in the shape of Horace all for **£5.**

Horace Goes Skiing runs on a Spectrum in 16 or 48K and is distributed by **Psion** in W. H. Smiths.

- **Getting started** 8
- **Value** 8
- **Playability** 7

ADDRESS FILE

Abbex Software
20, Ashley Court, Great Northway, London NW4.

Abersoft
7 Maes Afallen, Bow Street, Dyfed SY24 5BA.

Acornsoft
4a Market Hill, Cambridge, CB2 3NJ.

Allrian
1000a Uxbridge Road, Hayes, Middx. UB4 0RL.

Apex Software
115 Crescent Drive, Brighton, Sussex BN2 6SB.

Artic Computing
396 James Reckitt Avenue, Hull, N. Humberside HU8 0JA.

Atari International
Windsor House, 185-195 Ealing Road, Alperton, Wembley, Middx. **(Any Atari Dealer)**

Audiogenic
PO Box 88, Reading, Berks.

Automata Cartography
65a Osbourne Road, Portsmouth, Hants. PO5 3IR.

BBC Publications
Broadcasting House, Portland Place, London W1. **(Any BBC Dealer)**

Bridge Software
36 Fernwood, Marple Bridge, Stockport, Cheshire.

Bug-Byte
The Albany, Old Hall Street, Liverpool L3 9EG.

Campbell Systems
Rous Road, Buckhurst Hill, Essex IG9 6BL.

Centaur Software
6 Purcells Avenue, Edgware, Middx.

Centresoft
26 Great Cornbow, Halesowen, West Mids B6 33AE.

Commodore
675 Ajax Avenue, Trading Estate, Slough, Berks. **(Any Commodore Dealer)**

Computer Concepts
Dept. WM1, 16 Wayside, Chipperfield, Herts. WD4 9JJ.

Electric Pencil Company
1 Mount Vernon, Hull, N. Humberside.

Gemini Electronics
50 Newton Street, Manchester.

Hewson Consultants
60a St Mary's Street, Wallingford, Oxon. OX10 0EL.

Imagine Software
Masons Buildings, Exchange Street East, Liverpool L2 3PN.

Mac Games
See Morris Associates for this address.

Melbourne House
131 Trafalgar Road, Greenwich, London SE10.

Microx
52 The Strand, Worthing, Sussex.

Molimerx
1 Buckhurst Road, Town Hall Square, Bexhill-on-Sea, East Sussex.

Morris Associates
37 St Catherines Road, Baglam, Port Talbot, West Glam. SA12 8AJ.

New Generation Software
16 Brendon Close, Oldland Common, Bristol.

Pete & Pam Computers
New Hall Hey Road, Rawtenstall, Rossendale, Lancs. BB4 6JG.

Postern Limited
PO Box 2, Andoversford, Cheltenham, Glos. GL4 5SW.

Program Power
8/8a Regent Street, Chapel Allerton, Leeds LS7 4PE.

Psion
2 Huntsworth Mews, London NW1 6DD. **(Larger branches of W H Smith)**

Quicksilva
92 Northern Road, Southampton SO2 0PB.

Rabbit Software
380 Station Road, Harrow, Middx.

Salamander
27 Ditchley Rise, Brighton, East Sussex BN1 4QL.

Sharpsoft
86-90 Paul Street, London EC1.

Softek
329 Croxted Road, London SE24.

Spider Software
98 Avondale Road, South Croydon, Surrey.

Supersoft
Winchester House, Canning Road, Wealdstone, Harrow, Middx.

S.B.D. Software
15 Jocelyn Road, Richmond, Surrey TW9 2TJ.

Terminal Software
28 Church Lane, Prestwich, Manchester M25 5AJ.

Texas Instruments
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Thorn EMI
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Viking Software
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Workforce
140 Wilsden Avenue, Luton, Beds. LU1 5HR.

Ratings rundown

Here is a rundown of the categories our review team used to mark the games featured in this supplement.

Each game received ratings in three categories. These are defined as "Getting started": problems loading the tape and a measure of how much help a cassette or disc gives, in making the game easily accessible to the buyer.

"Value" looks at the value-for-money question and takes into account whether the game utilises all the facilities of the machine, presentation and packaging.

"Playability" refers to the enjoyment the game offers, whether it would hold the reviewers' interest or whether it is a good example of the type of game it is based on.

Each mark was made out of a possible 10 and we hope it will provide an accurate guide.

Symbols guide

The symbols beneath each review provide a quick check on what you will need to run that particular game on your computer. See the details below:

1. The game is available on cassette only. Not in disc or cartridge form.

2. The game is available in disc form only and not on cassette or cartridge.

3. The game needs extra memory to run. For ZX81 owners this will mean a 16K Rampack. For Atom owners we will assume a fully expanded computer as the norm.

4. The game uses a joystick.

5. The game needs something extra plugged in the user port to run. This symbol has also been used to show cartridge-only games.

THE BOOK OF REVIEWS
A supplement of Computer & Video Games magazine: March 1983
Edited by Eugene Lacey, **Production Editor** Tim Metcalfe, **Design** Linda Freeman, **Editorial & publishing assistant** Susan Cameron.
Editorial address: Durrant House, 8 Herbal Hill, London EC1R 5JB; Telephone: 01-278 6556.
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GAMES GLOSSARY

If you can tell a Pacman from a Defender and a Galaxian from a Space Invader you probably know your way around computer games.

But if some of the game terms we have used in this supplement, or in the issue itself, are new to you, then this page should supply the answers. In it we take some of the best known types of computer game and describe how they are played and what features these games normally incorporate.

So, if we claim that Penetrator is a "Scramble-type game" and that leaves you just as much in the dark about what to expect, then below there is a full description of Scramble to put you in the picture.

Asteroids

The Asteroids came into the arcades courtesy of Atari. It features a small dart-shaped craft controlled by the player which can rotate left or right and thrust or fire in the direction it is facing.

There is one further control, the panic button (hyperspace) which lets you travel to another part of the screen chosen by the computer.

The enemy is mainly made up of large asteroids which sweep across the screen in large deadly groups of rock. When blown up these break into smaller fragments worth extra points.

There is extra danger supplied by two UFOs. The first larger creature you'll meet fairly early on. It tends to spray shots in all directions and often crashes into an asteroid.

The smaller variety is far more deadly in its own shooting and also more difficult to hit. Each cleared screen means you start again with extra asteroids.

Defender

You can't expect to keep a finger on every control button in Defender or you'd end up in knots.

The action, which takes place above an alient landscape, involves some seven control buttons and takes patience to gain proper mastery of your lone craft.

That patience can be rewarded though, as Defender is challenging from the word "Go". The Defender craft can go: up, down, thrust forward, reverse direction, fire, smart bomb and hyperspace.

Ten humanoids wander on the landscape and these may fall prey to raiding alien creatures known as Landers. Landers pick up the humanoids and take them to the top of the screen. If they succeed in getting there the Landers turn into fearsome mutants hellbent on your destruction.

In all there are six alien opponents. On top of Landers and Mutants, these are: Pods are quite harmless but contain the small and persistent Swarmers; Bombers seed space with white bombs and Baiters only appear if you take too long clearing a screen of the rest of the aliens.

If all 10 humanoids are captured, the planet explodes and all remaining alien life attacks your craft at once.

Defender games usually feature a small radar screen which shows what is going on at all parts of the planet surface.

Frogger

Frogger has spawned a whole host of computer games with a similar theme.

This game features a frog hero who must jump across a road and make his way across a river torrent to five frog-holes in the bank.

The busy road usually features five streams of traffic travelling in both directions at varying speeds, between which the player must hop his frog without wrapping it around any fenders.

Once across the road, the river can be crossed by leaping onto floating logs and onto the back of swimming turtles, until our frog can enter a vacant spot in the far bank. Turtles have a habit of diving though so don't let a frog dally too long on one. Being carried off the edge of the screen (by log or turtle) also results in a note in the funeral column of *Amphibians' Weekly*.

When all five frog-holes have been filled, the game becomes more difficult with extra traffic being added to the road, snakes traversing the bank between road and river and alligators appearing instead of logs in the river.

A timer running down on each frog also adds to the difficulties. The arcade original also featured a small lady frog who could be "picked up" on the logs and offered a lift home for a bonus. Other bonuses can be scored by entering a frog-hole in which a tasty fly meal has come to rest.

Donkey Kong

Donkey Kong is the strange name for a climbing and jumping game which features a starlet-grabbing monster gorilla.

Often referred to as Crazy Kong or Crazy Climber in the computer circles, it has only just found its way onto the home screen.

The game features a gorilla holding a girl captive at the top of the screen and an intrepid hero (Mario the carpenter), who starts at the bottom of the screen.

Between the two is a connecting network of platforms and ladders up which Mario must run to achieve his rescue. Kong hurls barrels down the screen and Mario makes use of his "jump" button to leap over them. He can also grab a hammer and smash the barrels as they approach him.

Once at the top of the screen a new complex is built with Mario, again starting from the bottom with a view to rescue. This time the screen features a series of conveyor belts and deadly fires which travel around on the ladders and belts.

Galaxians

The Galaxians were the sons of Space Invaders. Instead of proceeding down the screen at a leisurely pace, they wavered at the top of the screen before swooping down in batches of two or three (or more often on a solo mission) firing bombs.

The player has the usual left, right and fire controls on his laser base and must take care not to get trapped in a corner. He scores double points for a galaxian hit in mid-swoop and there are bonus points for taking out the red fleet commanders, who usually descend flanked by their generals, dispersing bombs at such a rate that the first instinct is to flee for cover.

That is the essence of Galaxians but with each destroyed platoon, new waves appear at screen top and their attacks become more frequent, more accurate and, all too often, more deadly!

Pacman

The ghostly world of Pacman is made up of a dot-filled maze, a hungry dot-eater and four pursuing spectres.

Pacman variations can be found under a whole range of titles from Vic-men to Gobbleman, Snapper to Super Glooper and many others. Most dot-eating games are related to it.

The main character is the dot-eater, which travels around the maze, eating every dot he touches. His objective is to clear the screen of dots. He is hampered in this by the four chasing ghosts whose touch is lethal.

The Pacman's main defence against the ghosts, who usually number four, are energiser dots. These pulse in the four corners of the maze and, upon being eaten, reverse the roles for a short while.

This means that Pacman can turn the tables on the ghosts and eat them for bonus points. He is allowed only a few seconds of dominance before the usual hunter and hunted rules come back into operation.

It is also usual for fruits to appear on the screen occasionally and these too can be consumed by Pacman for bonus points. When Pacman has cleared the screen, it refills with dots and the game restarts except that this time the ghosts are a little livelier and a new fruit, worth extra points, appears at this level.

Scramble

Scramble should have a big one-way sign on its cabinet. The screen rolls from right to left, taking the player's craft along it into ever-increasing danger.

Scramble variations often contain the word "Mission" or "Attack" but there are some wierd and wonderful titles about.

The player controls a craft heading right across the screen over hilly terrain. His craft can never turn around and opt out of its mission but he does have some control over his destiny.

His controls are up and down, fast and slow and he can both bomb and fire at his enemies.

The Scrambler is not usually equipped with enough fuel to complete his task, but it is normal to obtain more fuel by bombing fuel tanks on the ground and so (mysteriously) replenish his own stocks.

The enemies come in all shapes and sizes. Most common are missiles which fire up from the ground as your craft passes overhead and alien invader creatures which frequently inhabit caves and fly at the player's craft.

The original Scramble game sent the player through a series of different terrains with new challenges in each section. And most computer Scrambles attempt to duplicate this with a number of different stages.

Scramble requires a cool head which can find the right control in a crisis, but it makes an ideal computer game as success naturally leads to new and more difficult stages.

Invaders

Space Invaders started the whole computer game craze back in 1977 and most gamers know the format backwards. Still, just a brief resume....

The invaders come in waves above the ground and move in rows across the screen one step at a time, firing missiles earthwards.

When one row of the aliens reach an edge of the screen, the whole platoon jump down a line and return back the way they came. When they achieve their slow progression to the bottom of the screen, the game ends.

The player controls a laser base which moves left to right and fires directly up from its position. His aim is to blow up the entire fleet before it reaches the bottom of the screen.

Flying saucers move across the top of the screen in both directions and can be hit for a mystery bonus score. In the arcade original, top saucer scores of 300 were achieved by firing 22 shots before shooting at the first saucer, then firing 14 shots in between each subsequent saucer. Some computer versions have copied this technique.

MARCH 1983
75p

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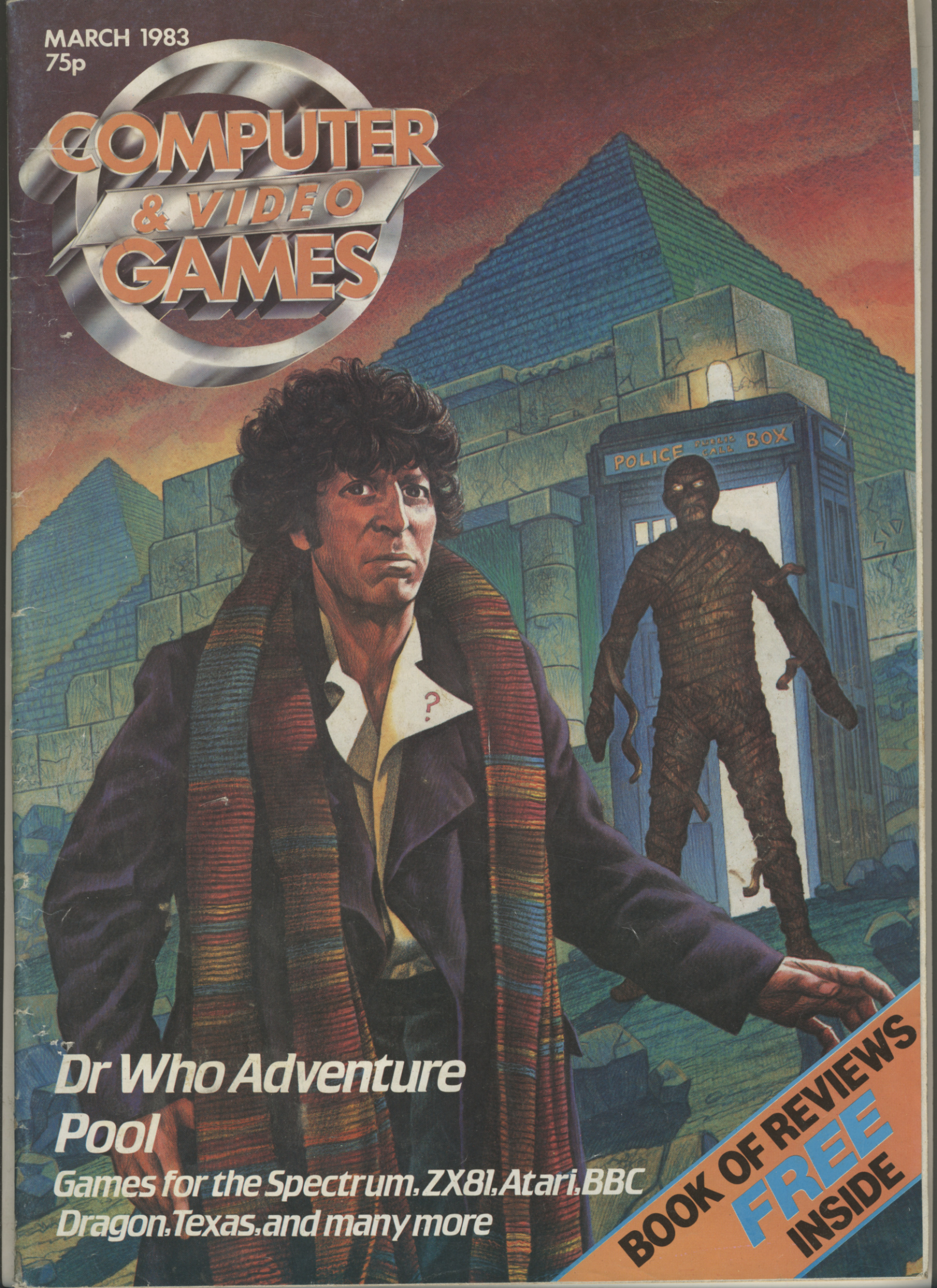

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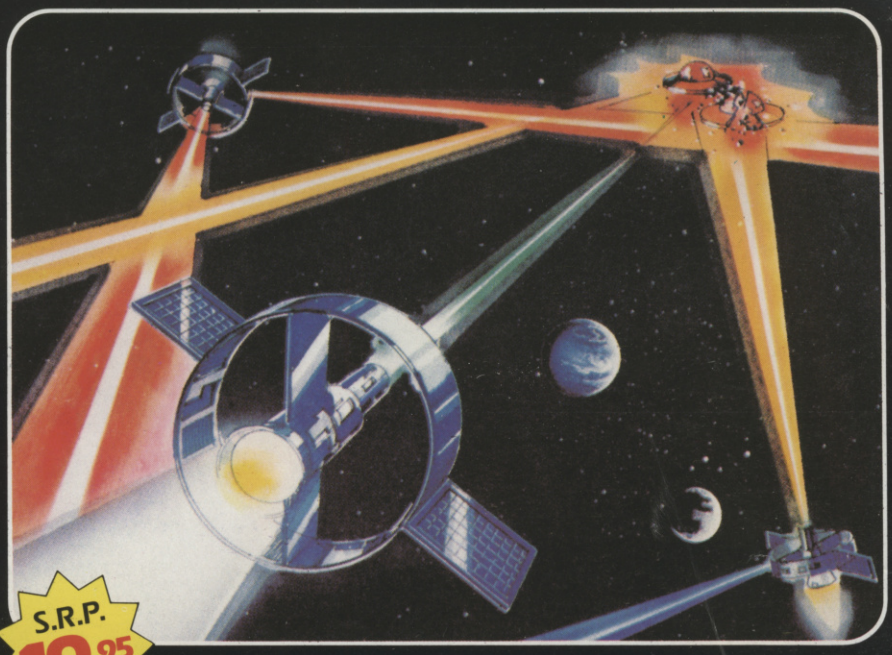

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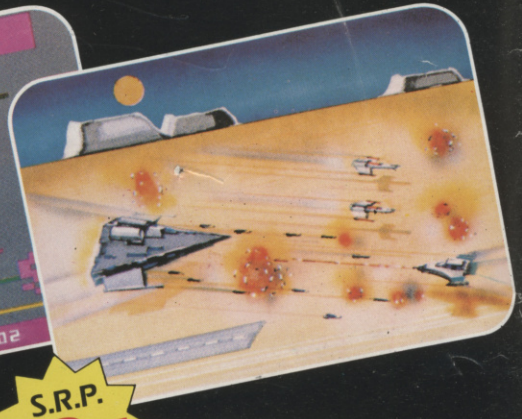

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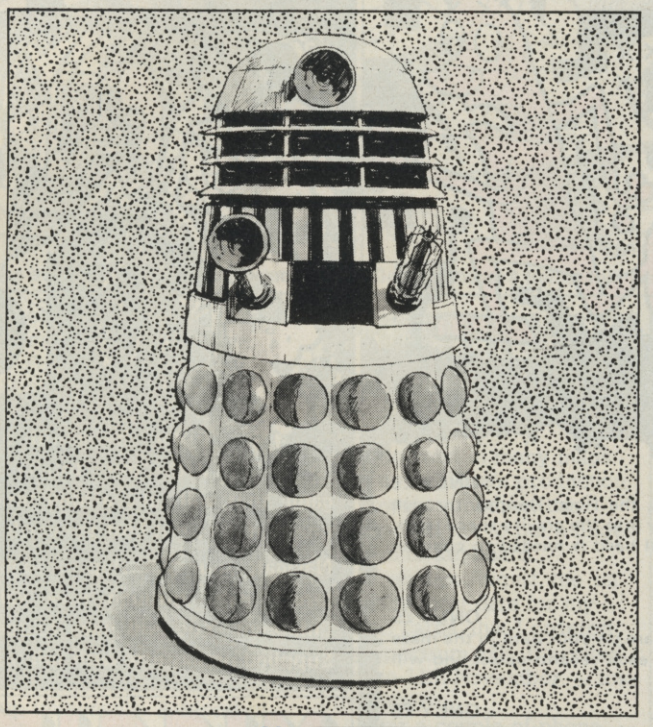

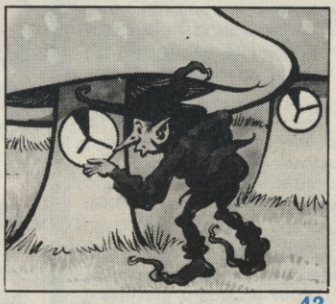

Empire news . . .

Calling all you space tribe commanders: the galactic messengers are reporting on the results of the first interstellar conflicts on page 23.

There is also word on the richest planetary systems over the last parsec and the latest on empire upheavals and the current peace treaties and warfare.

If you have proved an able commander of space fleets then you may be in our top 10 profit-makers. We also announce the overall champion of our first Seventh Empire conflict.

An entry form for the next April issue turn of Seventh Empire is on page 11 and we announce our overall prize for the top Seventh Empire scorer for the first six months on page 22.

Our Book of Reviews may already have tried to fall out of this issue. But if it's still to be found in the centre pages, you'll find news of over 70 professional software tapes, tried, tested and marked.

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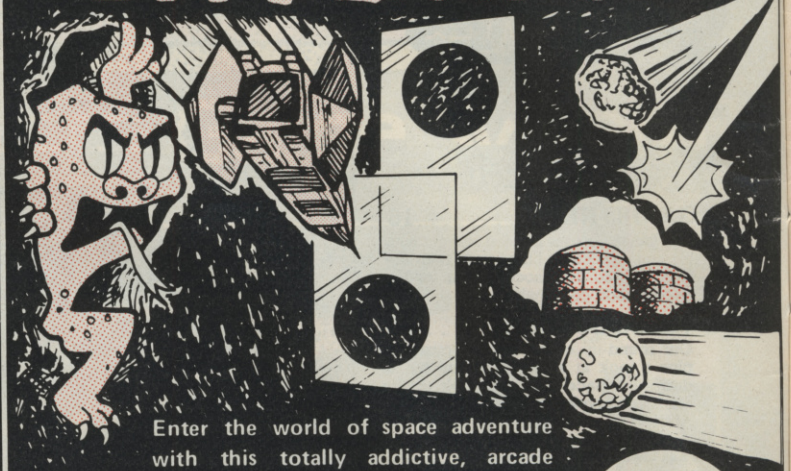

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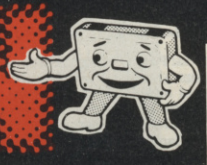

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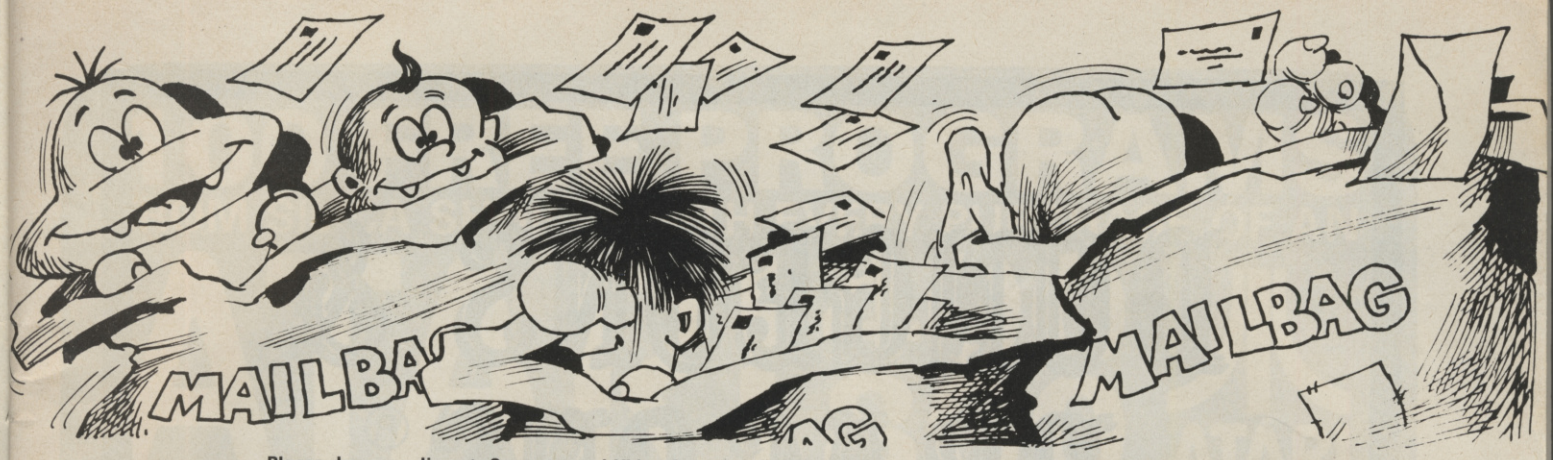


Please drop us a line at: Computer and Video Games, EMAP, Durrant House, 8 Herbal Hill, London EC1R 5JB.

SPECTRUM DEBATE . . .

Dear Sir,
I would like to make my own comments on the so-called BBC versus Spectrum conflict.

Many people believe that the Spectrum is the greatest computer ever made, in the same way that they thought the ZX81 was a year ago.

In fact the Spectrum is only one of many computers with features that are today regarded as standard.

However, the ZX Spectrum has one advantage over all the rest — its price. It is a cheap computer. A "Jack of all trades" and master of none.

Inevitably Sinclair's machine will become the most popular, greatly aided by his adverts that leave the readers with both a good impression of his machine and a bad impression of the rest.

The BBC micro is a very powerful machine, no matter how much Sinclair and his fans will degrade it. If it was anything less, it would not have been chosen as the BBC's micro.

Also, the designers of Acorn have taken great care to make sure their machine is not outdated in the future, and as a long term investment this machine is real value for money.

David McKeran,
Sunderland,
Tyne and Wear.

. . . GOES ON AND ON . . .

Dear Sir,
I am writing to you referring to the letter that a Mr. McAuley wrote in your December issue. As far as I can see anyone must be stupid at turning down an offer for a BBC Model A, even when a Sinclair Spectrum with all its extras is offered as an alternative.

For just £60 extra the Model A can become a Model B and many more peripherals are instantly available.

The Tube allows another processor to be added and so at least doubles processing speeds. Even without the second procesor the BBC is the 3rd fastest machine according to bench tests.

Delivery has been stepped up immensely. A friend of mine ordered one only a week ago and it arrived yesterday. I bet Sinclair can't say that about his Spectrum or indeed any of his computers. My conclusion is that the BBC computer will still be in great demand by the year 2900.

As for the Spectrum I expect that will be replaced by the ZX83 next year.

If this letter were to be published I am sure it would give people something to think about.

Tim Place,
Thornborough,
Buckinghamshire.

I KNOW WHAT IS BEST!

Dear Sir,
Truly a remarkable breakthrough in computer magazines. I find your magazine fun to read and very entertaining, especially the software reviews. Is the BBC Defender the only game to get 10/10 for playability?

I write to you concerning the letter sent in by Mr Alan McAuley (December 1982) degrading the model A BBC.

As far as I am concerned the Spectrum cannot match the BBC in any respect. It is the quality of the Beeb that puts it above the competitors.

Mr S. S. Alg,
Fulham,
London.

PRINTER WITH A PROBLEM

Dear Sir,
Having read in many mags that uncle Clive's production is now on schedule, has compelled me to put a finger or two to keyboard.

It was last August, the 1st actually, best date for my credit cards, that I ordered my Spectrum 48K. It arrived on the 11th November — less the printer.

After a couple of phone calls it arrived about a week later. I'll be able to list some of my programmes I thought. Well, it listed 10 lines and stopped.

So I sent the lot back. I received a letter asking me what I wanted them to do with the printer. Please return everything in working order I replied.

That was on the 26th November 1982, and I am still waiting.

I can quite understand why Clive has a production problem, obviously repairing more units than he is making.

Kenneth C. Alford,
Sheerness,
Kent.

COLOUR CODE FOR BBC

Dear Sir,
Congratulations on an excellent magazine.

I find the reviews of software a great help in deciding what to spend my money on. I am particularly looking forward to your "Seventh Empire" competition which I have entered.

I totally agree with M. D. Caballero's remarks about the ZX Spectrum leaflet, in my opinion the BBC model A and certainly the Atari 400 are miles better than the Spectrum — at least the BBC has a decent keyboard.

As for the pathetic sound on the Spectrum being compared to the three channels on the BBC and the four on the Atari I think it's ridiculous!

As you might of guessed I am a BBC owner and I wonder if you might be able to answer a question for me. Are there any Scott Adams adventure games available for the BBC B?

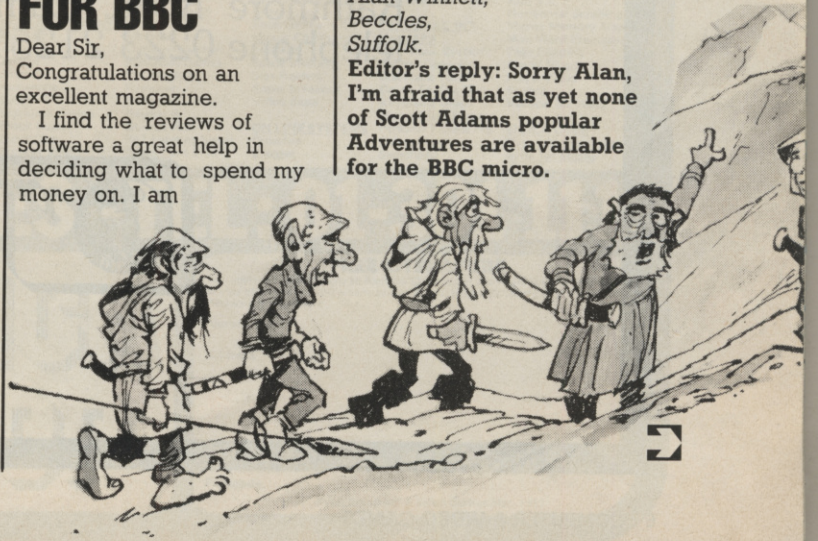
You may also be interested to know that when using mode 2 graphics on the BBC B it is possible to get 255 different shades of colours. The short program below will illustrate this.

```
10 MODE 2
20 GCOL RND(30), RND(255)
30 PLOT
85,RND(1280),RND(1024)
40 GOTO 10
```

The method only works if you have a number over about 20 in the first half of the GCOL statement.

Alan Winnett,
Beccles,
Suffolk.

Editor's reply: Sorry Alan, I'm afraid that as yet none of Scott Adams popular Adventures are available for the BBC micro.



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MAILBAG

IAN FINDS A FRIEND

Dear Sir,
With reference to your Mailbag column in the January issue, and the request by Ian Bailey of Streatham, London. I am in the position to be of assistance to him as I own a TRS80 16K level II machine and line printer III.

If he wishes to forward the tapes of the programs to me I will list them for him and return them along with the listings.
W. I. Temple,
Glasgow.
Editor's reply: There you are Ian, *C&VG* readers are a useful bunch to know!

BOMBER BACK ON TARGET

Dear Sir,
With reference to *Confessions of a Bug,* October 1982, I have the reason why so many people enquired about the errors in the Atari Bomber program printed in September.

Apparently, the program was written on a 400 which probably had only 16K or RAM. Bomber works perfectly for 16K machines, but problems arise when the memory is expanded.

This is because screen RAM is located right at the top of memory and will therefore change when memory changes.

In the program, all screen POKE locations are those for a 16K machine. I have a 32K 800 and the program would not work for me. When I removed one of the 16K RAM packs, it worked perfectly. I therefore give amendments to the program, to allow the program to be run on non-16K machines.
Change: 10 GRAPHICS 1+16: B=15965 to: 10 GRAPHICS 1+16: RAM=PEEK (741)+256*PEEK (742)+33: B=RAM+221

The variable RAM now holds the address of the top left-hand corner of the screen.

Now change, in the program, any occurrence of the addresses below to the expression on the right.
15983=RAM+239
15943=RAM+199
15923=RAM+179
16003=RAM+2549
15965=RAM+221
15745=RAM+1
16205=RAM+461
15764=RAM+20
16183=RAM+439
Christopher Simon,
Clwyd,
North Wales.

SHIFTING MEMORIES

Dear Sir,
I am the satisfied owner of a Commodore Vic-20, but after having it for some months I feel the need to expand it. However this is causing me some concern as I have read that when memory cartridges are plugged into the Vic the memory shifts. Not only does it just shift when cartridges are inserted, but it just shifts differently when you have 5K, 8K or above 8K.

Does this mean that programs written for the unexpanded machine will not run on an expanded machine because of the shift? And also programmes that need an expansion of 8K will not run on a machine with a 16K pack even though there is plenty of memory?
Jonathan Phillips,
Lydney,
Gloucestershire.
Editor's reply: The answer to your first question is not without some programming. In answer to your second question — it would depend on the memory expansion board.

SORTING OUT THE BUGS

Dear Sir,
I have found another bug in the ZX81 manual: Appendix A, the character set, starts:- "The ZX80 character . . ."

Is Uncle Clive pulling a fast one, or is it yet another bug?
Andrew Park,
Darlington,
Co. Durham.

QUESTIONS FOR VIC

Dear Sir,
As a reader from the first issue of your great magazine I decided it was time to write to you with a question! Is it possible to connect my VIC-20 to Cefax or any other service? If so, how much?
Neal Kovac,
Ruddington,
Nottingham.
Editor's reply: It is possible to connect most microcomputers to the Prestel viewdata service of British Telecom. It is not really feasible to use one of the Cefax/Oracle teletext service of BBC/ITA.

The Vic-20, unfortunately, is not the easiest system to interface for Prestel, as it only has 22 columns of the screen whereas Prestel needs 40. B & B computers of Bolton did manufacture a 40-column adapter which could interface with Prestel — unfortunately Beelines, their supplier, has just gone bust. If you contact them though, they may still have some in stock.

SWITCH TO STATESIDE

Dear Sir,
My son has outgrown his Sinclair ZX81 and is looking for another model.

As we may be moving to the States in the next couple of years, are there any computers, besides the Atom, which are dual voltage and compatible with U.S. TV? He is somewhat interested in the BBC micro, but we suspect it is not dual voltage.

I might add that my son enjoys hours of pleasure with your magazine. No longer is he a TV addict — he's now a computer addict!
J. Mansfield,
Clayton,
Newcastle.
Editor's reply: The U.S.A. and Europe use totally different TV systems. The problem of voltage is easily overcome with a transformer. Unfortunately there is also a difference in mains frequency, 60Hz in U.S.A., 50Hz in Europe. Only a mains frequency converter will overcome this, and their cost is around £100+.

It is possible to bring U.S. equipment to the U.K., and vice-versa if a transformer/frequency converter is used.

You will need to use a multiple standard TV set/monitor though. These have both the European PAL colour TV standard and the U.S./Japanese NTSC standard on them. Again they are expensive and will cost about £500/£600. Most radio/TV shops in London sell them and they are easy to get hold of.

So, count on spending near £1,000 to enable you to move across the Atlantic. It may be cheaper to buy the appropriate system when you arrive!

MISLEADING ADVENTURES?

Dear Sir,
I have recently purchased a BBC model B micro and several commercial games. Some of these games are excellent, Micro Power in particular. However, there are a lot of very boring games advertised that I consider are misrepresented.

One Adventure game says "what next?" interminably and another "what shall I do now?" until you feel like throwing something at the set. There are some very good Adventure games, with humour but a lot are "user hostile", especially the "Ha, Ha you are dead" type.

My chief reason for writing however is the misrepresentation in advertisements as to whether games have graphics and sound. Many imply this but are only word games. They should clearly state that there are no graphics.

Even this is no guarantee as I have just returned a taped game to one of your larger advertisers asking for a refund for although the advert clearly states that the game has sound and graphics, but it does not.
Allan H. Miles,
Exeter,
Devon.

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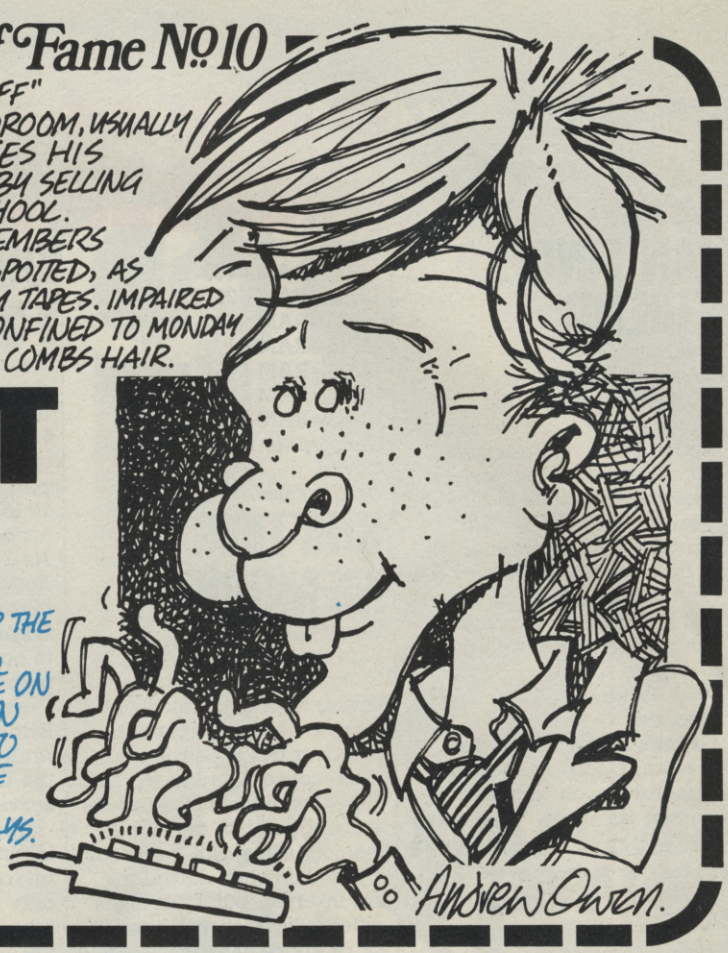

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TWO PINBALL WINNERS

The Bally pinball competition which we set in our September issue has two winners not one.

All the entries were despatched to the US where Bally's team of top pinballs and video game designers set about judging your entries and thoroughly enjoyed the job too.

The entries were separated into the video game and pinball categories and such was the depth of imagination and careful thought which you had put into your ideas, that it took them far longer than they had thought to come up with a winner.

The result: a winner of each section and several highly commendeds too. Our Pinball winner was Andrew Muir from Grove Road, Norwich with his game Alcatraz who wins a Bally pinball machine to take home and set up in his living room.

Our most imaginative video game designer was 13-year-old Ian Boffin of Lych Way, Hansell, Woking, with his shark game Jaws. For Ian Bally have put up an extra prize of an Intellivision TV games centre.

Congratulations to these two and C&VG will also be finding something for the entries which came second and third in each category too. Full details of the winning entries will appear next month.

EMPIRES BECKON

If you have already entered our Seventh Empire game, you do not need to re-enter we will include you as soon as possible. But if you are new to *C&VG* and would like to enter fill in the form below and we will send you a rulebook and fleet starting positions for our next issue.

Please include me in the Seventh Empire game for April.

I would like to name my tribe the .....

.....

.....

My name is: .....

.....

Address: .....

.....

.....

.....

Tel: .....

PUZZLING SOLUTIONS

For those of you still struggling with the Puzzling problems on page 80, the answers are presented here. But please try them first, either in your head or by using a computer program.

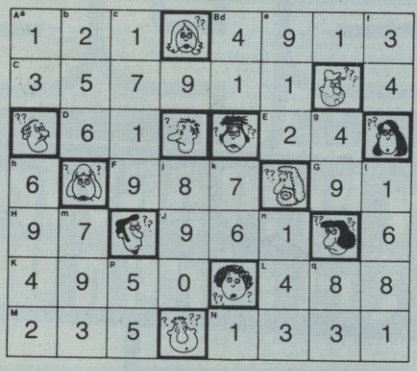
Noah's problem with the ark of confused animals can be just as confusing for humans. In order of the first half the specimens are: Amoeba, Canary, Ferret, Iguana, Locust, Magpie, Oyster, Parrot, Shrimp, Spider, Turkey and a Weasel.

The solution to On the Cards is that Dan took the card with "Vixen" written on it and Bob wrote "Surly".

Turning the digits in our symbol sum into figures gives the following piece of arithmetic:

598
507
8047
9152

And the correct solution to the Cross number problem is printed right:



The Blooming Problem has been left in your capable hands until next month, by which time 10 of you should be the proud owners of a Vulcan Electronics Hungarian Ring to puzzle over. Send your entries in by March 12 please.

Finally, congratulations to the winners of our Space Attack problem set in January's Puzzling. A Ripper of Ormskirk, Lancs; E Marten of Southall in Middlesex and G Holden of West Ealing, London; have all won a Computer Games' Galaxy Invader 1000.

Commiserations to the losers some of whom bounced wrongly or made other illegal moves. The best score was published last month. And thanks for the Gaudy Monster entries. No prizes here but top scorer was Joan Lockett of Shrewsbury with 559.

A BUG CONFESSES ALL . . .

They should have known better than to try and sneak a book of games past us.

We slipped Snag Jnr. in there at the last moment to cause a bit of havoc with Red Alert on the Vic-20. It does not need the 16K of memory suggested in the write up and runs on a normal 3.5K machine.

Several people couldn't get their Red Alert plane to fire missiles. A complete rundown on the instructions is:

a —spacecraft goes up
; —spacecraft goes down
P —spacecraft goes left (backwards)
* —spacecraft goes forwards
Pressing shift drops the bombs
Shift and the asterisk "*"fires horizontal missiles

Those of you who called on Fruit Machine were having problems keeping the fruits in their boxes. We tracked this down to line 1. The final statement in this line reads "SR=36879".

Dodgems for the BBC Model B runs on the 1.0 operating system machine and some of the commands in this program will not run on the 0.1 machine.

Texas owners are up in arms about the Pompeii listing which became embroiled in an erupting volcano. A call or letter to the *C&VG* offices will result in the hidden part of listing being made clear.

T. Hitch got to grips with Keith Campbell's Adventure page. The block and line ranges in figure one should have read: Block 1, 10-50; Block 2, 50-100; Block 3, 100-450.

Missile Command suffered from a couple of missing semi-colons but first people seemed to track these down: 210 was the offender. Each C4 in this line should be followed by a semi-colon.

The editor has asked me to apologise for the lack of a Starweb write-up this month due to a space shortage. Also out went Next Month and the promised version of Donkey Kong for the Vic-20, called Logger. This will appear in April.

spectrum

AN APOLOGY from Spectrum UK

We'd like to apologise on behalf of all **SPECTRUM** dealers and in fact our suppliers. Unprecedented demand has caused a severe shortage of home computers nationwide. This situation is liable to continue for a few weeks, **but as soon as new stocks are available your local SPECTRUM dealer will be among the first to have them.**

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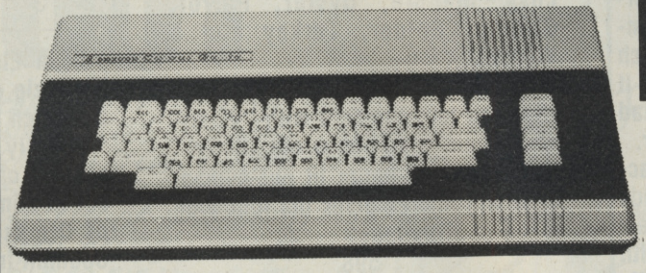

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COLOUR GENIE ACCESSORIES

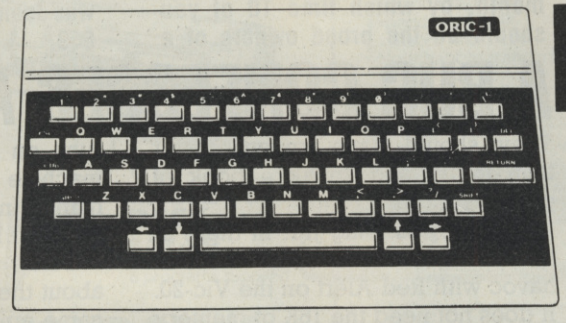
	Ex. VAT	Inc. VAT
Joysticks – –	– £43.04	£49.49
16 K RAM – –	– £33.48	£38.50
Printer Cable –	– £34.35	£39.50

VISCOUNT-Teach yourself Colour Genie £6.95

Spectrum LOW Price

£224.48 Inc.VAT

SPECTRUM FACTS Maximum user RAM 14,200 Bytes approx.



ORIC-1

A **superbly designed and engineered** micro and **great value-for-money from SPECTRUM.** Offering **48K RAM Colour** – (8 foreground and 8 background can be displayed at same time) **High resolution graphics User definable Graphics. Full sound** (6 octaves of controllable sound.) **Easy to use keyboard** with **moving keys. Standard Centronics parallel interface** allows easy connection to a wide range of printers etc. Ask to see the new **ORIC-1** at your local **SPECTRUM** dealer today!

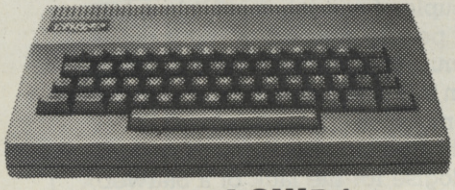
Spectrum LOW price £169.95 Inc. VAT

VISCOUNT – Teach yourself ORIC BASIC £6.95

Available late FEB, BBC language £17.95 inc vat

SPECTRUM FACTS Maximum user RAM 47,870 Bytes — in very short supply

New! LYNX



Spectrum LOW Price

£225.00 INC VAT

£196.65 ex vat

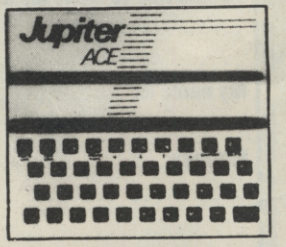
VISCOUNT – Teach yourself LYNX BASIC £6.95

Just look at this **super new LYNX Micro** – an **incredible** 16K + 32K video ram and that's **expandable** up to or beyond **96K.** For just **£225.00 INCLUDING VAT** the **LYNX** is **exceptionally versatile.** All **LYNX's** 'add-on' connections are **standard types.** The **high definition colour graphics** make it a **top-value choice** for the **home or office** (with expansion, the LYNX can become an 80 characters-per-line word processor!) Take a look at the **LYNX** – a **memorable bargain** from **SPECTRUM,** But please phone to check stock position **before making a journey** as this new machine is bound to be in **great demand.**

SPECTRUM FACTS
Maximum user RAM 13,700 Bytes approx.– in very short supply

JUPITER ACE

Outstanding value-for money! The **JUPITER ACE** uses easy to understand **FORTH** language. **Connects to your own TV. 3K RAM expandable to 19K. Full moving keyboard** with auto repeat and caps lock. **Full sound and chunky graphics.** Ideal for the home, office or schools etc. Supplied complete with mains adaptor, TV and cassette recorder connection leads etc. See it at your local **SPECTRUM** dealer **NOW!**



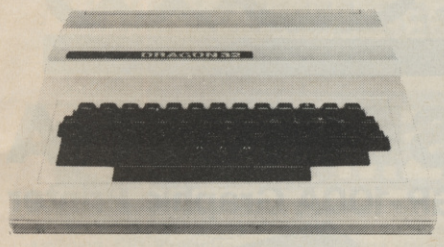
Spectrum LOW price £89.95 Inc VAT **£76.22 ex vat**

SPECTRUM FACTS
Maximum user RAM 1,000 Bytes approx.

Not all stores carry every advertised item, please phone before making a journey – Prices correct at time of going to press E. & O.E.

HURRY! Limited stocks only-

DRAGON



Unbelievable value at only £199.95 from **SPECTRUM**! British built and designed it's one of the **most impressive micros** to appear for quite some time. Extensive facilities include highly advanced colour graphics. Just look at this top specification: Powerful standard 32K RAM (expandable to 64K Bytes). ■ 9 Colour, 5 resolution Display. ■ Extended Microsoft colour BASIC (as standard). ■ Advanced sound with 5 octaves – 255 tones. ■ Professional style editing, e.g. extract line, auto find reinsert. ■ Professional quality keyboard. ■ Centronics Parallel printer interface. ■ Serious programmer/user – the BASIC on this machine is similar to that found on machines costing 3 times the price! ■ Uses almost any cassette recorder. ■ Standard file handling ON TAPE.

Spectrum LOW price £199.95 INC. VAT

(£173.87 exc. VAT)

	EX VAT	INC VAT
ACCESSORIES		
Joysticks (pair)	£17.35	£19.95
Cassette Lead	£2.35	£2.70
CARTRIDGES		
Beserk	£17.35	£19.95
Cosmic Invaders	£17.35	£19.95
Meteroids	£17.35	£19.95
Ghost Attack	£21.70	£24.95
Cave Hunter	£17.35	£19.95
Starship Chamelion	£17.35	£19.95
CASSETTES		
Calixo Island	£6.91	£7.95
Graphic Animator	£6.91	£7.95
Quest	£6.91	£7.95
Madness and the Minotaur	£6.91	£7.95
Examples from Dragon Manual	£6.91	£7.95
Personal Finance	£6.91	£7.95
Dragon Mountain	£6.91	£7.95
Typing Tutor	£6.91	£7.95
Black Sanctum	£6.91	£7.95

SPECTRUM FACTS
Maximum user RAM 29,679 Bytes

VISCOUNT Software for **DRAGON** Teach yourself Dragon Basic **£6.95**

ATARI

ATARI 800 16K RAM

The top selling ATARI 800 at a sensational new LOW LOW price from SPECTRUM. It's the ideal home or business computer with an extensive range of EDUCATIONAL, GAMES, PERSONAL FINANCE and BUSINESS programmes and aids available. It features a typewriter keyboard, 16K memory that's easily expandable to 48K with convenient, slip-in ATARI Memory Modules. It's expandable, which means you can build the computer system you want today, knowing that it will grow to meet your needs tomorrow – making it ideal for the business man. You can add printers, programme recorders, disk drives and more.

Sensational NEW LOW Price

£399.99 INC. V.A.T.

(£347.82 excluding VAT)

SPECTRUM FACTS
Maximum user RAM 13,323 Bytes

ATARI 400
16K RAM

£198.95

INCLUDING V.A.T.
(£173 excluding V.A.T.)

SPECTRUM FACTS
Max. user RAM 13,323 Bytes
BASIC cartridge extra

£39.99 inc. VAT
(£34.77 ex. VAT)

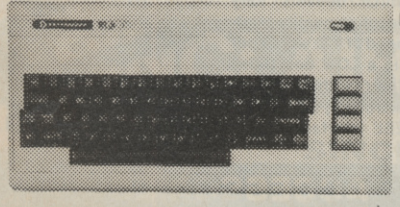
ATARI DISK DRIVE
£299.00
INCLUDING V.A.T.
(£260 excluding V.A.T.)

ACCESSORIES, BOOK & GAMES for ATARI

	EX VAT	INC VAT
Accessories		
Thermal Printer	£173.00	£198.95
16K RAM Pack	£56.52	£65.00
Paddles (Pair)	£12.17	£13.99
Joysticks (Pair)	£12.17	£13.99
I/O Cable	£11.30	£12.99
Printer Cable	£24.78	£28.50
RS232C Cable	£21.74	£25.00
Monitor Cable	£21.74	£25.00
Thermal Paper	£3.48	£4.00
DOS. 2 Master Diskettes	£19.12	£21.99
5 Blank Diskettes	£13.91	£16.00
Power Adaptor 400/800 9v/6v S00705	£9.35	£10.75
Mains Adaptor	£4.61	£5.30
5 Pin Din connector	£2.17	£2.50
Books & Manuals		
Wiley Manual	£5.99	No VAT
Basic Reference Manual	£5.21	No VAT
DOS. 2 Manual	£5.21	No VAT
Operating System Listing	£10.43	No VAT
DOS. Utilities Listing	£3.47	No VAT
Home Computer Programs – Home/Office		
Word Processor (Disk)	£86.95	£99.99
Graphit	£13.03	£14.99
Statistics 1	£13.03	£14.99
Telelink 1	£19.12	£21.99
Mortgage & Loan	£13.03	£14.99
Microsoft Basic (Diskette)	£52.17	£59.99
Home Study (Cassette except where stated/		
INV. to programming 1	£17.38	£19.99
INV. to programming 2	£19.99	£22.99
INV. to programming 3	£19.99	£22.99
Conversational French	£34.77	£39.99
Conversational German	£34.77	£39.99
Conversational Italian	£34.77	£39.99
Conversational Spanish	£34.77	£39.99
Energy CZAR	£13.03	£14.99

	EX VAT	INC VAT
European Countries & Caps	£13.03	£14.99
Hangman	£13.03	£14.99
Kingdom	£13.03	£14.99
Scram	£17.38	£19.99
States & Capitals	£13.03	£14.99
Touch Typing	£17.38	£19.99
Music Composer (Cartridge)	£31.30	£35.99
Pop Demonstration Cartridge	£21.73	£24.99
Home Entertainment (Cartridge except where stated)		
Asteroids	£26.08	£29.99
Basketball	£21.73	£24.99
Blackjack (Cassette)	£13.03	£14.99
Caverns of Mars (Disk)	£26.08	£29.99
Centipede	£26.08	£29.99
Computer Chess	£21.73	£24.99
Missile Command	£26.08	£29.99
PAC Man	£26.08	£29.99
Space Invaders	£26.08	£29.99
Star Raiders	£26.08	£29.99
Super Breakout	£21.73	£24.99
Video Easel	£21.73	£24.99
Cribbage & Domino	£17.35	£19.95
European Scenic Jig-saw	£17.35	£19.95
Hickory Dickory Dock	£17.35	£19.95
Programming Languages & Aids		
Assembler Editor	£34.77	£39.99
Atari Basic Cartridge	£34.77	£39.99
Macro Assembler (Disk)	£52.17	£59.99
Pilot (Consumer)	£52.17	£59.99
Pilot (Educator)	£78.25	£89.99
Entertainer Kit (Star Raiders Missile Command & Pair Joysticks)	£60.86	£69.99
Programmer Kit (Basic Cartridge & Manuals)	£43.47	£49.99

Commodore VIC-20



Now a top quality home/business micro for the price of a games machine.

■ Memory expandable to 32K ■ High resolution (full PET type) graphics ■ 16 Screen colours and 8 border colours ■ Plugs in to your TV. or monitor ■ Add Disk Drive & Printer for impressive 170K Byte system ■ Can act as an intelligent terminal for a larger computer.

VISCOUNT SUPER X2
64K DYNAMIC RAM PACK for VIC-20
EXCLUSIVE TO SPECTRUM!

Unbelievable-but-true, now you can up grade your VIC-20 from 3.5K to a massive 67½ RAM. Enables you to load up to 8 games or programs at a time & still select which one you wish to use. Can be used in conjunction with other expansions to increase total memory up to 152K-using the VIC memory expansion board. The SUPER X-2 will make your VIC-20 the biggest little micro in town!

Spectrum LOW price £114.94 INC. VAT

(£99.95 excluding VAT)

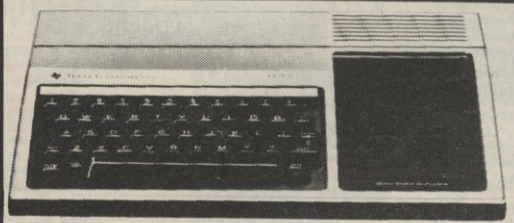
Spectrum LOW Price

£129.90 INCLUDING VAT

(£112.96 Excluding VAT)

SPECTRUM FACTS
Maximum user RAM 3,853 Bytes

TEXAS TI99/4A



SPECTRUM FACTS
Maximum user RAM 14,500 Bytes approx.

■ 16K RAM (expandable to 48K) ■ Built-in 14K Byte BASIC interpreter ■ 16 Bit Microprocessor ■ 16 Colour High Resolution graphics ■ Extensive range of solid state software command modules available from games to architectural aids.

Spectrum LOW Price £154.95 INC VAT
(£134.74 ex. VAT)

	EX. VAT	INC. VAT
TEXAS PERIPHERALS		
Speech Synthesizer	£40.50	£46.58
Peripheral Exp. System	£122.00	£14.30
Disc Cont. Card	£124.30	£142.95
Disc. Drive	£234.74	£269.95
RAM Exp. Card	£179.57	£206.50
Matrix printer	£347.78	£399.95
Software Entertainment		
TI Invaders	£16.48	£18.95
Tombstone City	£19.96	£22.95
Attack	£19.96	£22.95
Parsel	£23.45	£26.96
Car Wars	£23.43	£26.95
Munchman	£23.43	£26.95
Adventure & Pirate	£31.26	£35.95
Education		
Number Magic	£12.13	£13.95
Addition/Subt. 1	£23.43	£26.95
Teach yourself begniners		
BASIC	£8.26	£9.50
Home Budget Management	£19.96	£22.95

. . . and many more

MORE SPECTRUM LOW PRICES!

Spectrum Computer Centres have no connection whatsoever with the ZX-Spectrum Computer manufactured by Sinclair Research Ltd.

spectrum

A few examples from our

Software Selection

THORN EMI

Software for Atari	Inc. VAT
Submarine Commander	£34.44
Jumbo Jet Pilot	£34.44
Soccer	£29.84
Kickback	£29.84
Home Financial Management	£19.49
Darts	£19.49
Snooker & Billiards	£19.49
Pool	£19.49
Cribbage & Dominoes	£14.89
Humpty Dumpty/Jack & Jill	£14.89
Hickory Dickory Dock/Baa Baa Black Sheep	£14.89
British Heritage Jigsaw Puzzles, Vol. 1	£14.89
British Heritage Jigsaw Puzzles, Vol. 2	£14.89
European Scene Jigsaw Puzzles, Vol. 1	£14.89
European Scene Jigsaw Puzzles, Vol. 2	£14.89
Super Cubes & Tilt	£14.89
Figure Fun	£14.89
Cupute 4 & Reversi	£14.89
Owari and Bull & Cow	£14.89
Software for Commodore	
River Rescue	£25.24
Vic Music Composer	£25.24

GEM

Software for ZX81, Dragon and Spectrum	Inc. VAT
Monster Mine (for ZX 81)	£4.95
Monster Mine (for Spectrum)	£4.95
Monster Mine (for Dragon)	£7.95
Space Mission (for ZX 81)	£4.95
Space Mission (for Spectrum)	£4.95
Space Mission (for Dragon)	£7.95
Dragon Golf	£7.95
Dragon Character Generator	£9.95
Games, Pack I	£7.95
Games, Pack II	£7.95

SALAMANDER

Games for Dragon 32	Inc. VAT
Dragon Trek	£9.95
Wizard War	£7.95
Vulcan 'O/+	£7.95
Games Compendium DI	£7.95
Golf	£7.95

RABBIT

Software for Commodore VIC20	Inc. VAT
Space Storm	£6.49
Ski Run	£4.49
Dune Buggy	£4.49
Super Worm	£4.49
Jungle	£4.49
Cosmic Battle	£4.49
Frogger (3K)	£9.49
Rabbit Functions	£4.49
Code Breaker	£4.49
Night Flight (3K)	£4.49
Rabbit Writer (16K Cassette)	£19.49
Rabbit Base (16K Cassette)	£14.49
Myriad (3K)	£9.49
Charset/20 (3K)	£4.49
Skramble	£9.49
Space Phreeks	£9.49
Night Crawler	£9.49
Hopper	£9.49
Tank War	£7.49
Rabbit Base (16K Disk)	£16.49
Rabbit Writer (16K Disk)	£21.49
Rabbit Calc (16K Cassette)	£19.49
Rabbit Calc (16K Disk)	£21.49

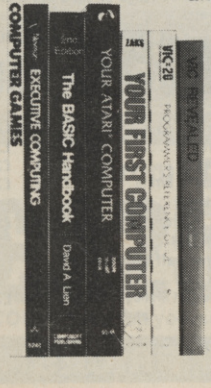
KUMA

Software for Sharp	
Electron 22622	£9.20
Cribbage	£12.08
Adventure	£12.08
Chess	£16.68
Map of UK	£12.08
Music Composer	£12.08
Junior Maths/Stepping Stones	£6.33
Home Budget	£6.33

AUDIOGENIC

Programs for VIC-20	Inc. Vat
Amok	£6.95
Alien Blitz	£7.95
Golf	£7.95
Spiders of Mars	£19.95
Sattelite & Meteorites	£19.95
Bonzo	£7.95
Trashman	£19.95
Boss	£14.95
Tank Attack	£19.95
Word Craft Word Processing package	£125.00

Plus many more at your local SPECTRUM dealer — call in now and see!



BOOKS

SELECTION FROM THE COMPUTER BOOKSHOP	
30 Hour Basic for the B.B.C. Micro	£5.95
Let your B.B.C. Micro Teach You To Programme	£6.45
B.B.C. Micro Revealed	£7.95
Over The Spectrum	£6.95
60 Games and Applications for the Zx Spectrum	£4.95
Programming The 6502	£9.95
Programming Your Zx Spectrum	£6.95
ZAP Pow Boom for the Vic 20	£7.95
The ZX Spectrum Explored	£5.95
Vic Inovative Computing	£6.95
Mastering Machine Code on Your Zx81	£7.50
The Zx Spectrum and how to get the most from it	£5.95
Easy Programming for the ZX Spectrum	£5.95
30 Programmes for tle B.B.C. Micro	£4.95
CPM Handbook	£11.50
Programming the Z80	£11.95
20 Best Programmes for the ZX Spectrum	£5.95
Getting Aquainted with your Vic 20	£6.95
Machine Code and Better Basic	£7.50
The Cambridge Colour Collection (Spectrum)	£6.95
Vic Revealed	£10.00
De RE Atari	£17.00
ATARI Operating system listing	£10.43

SEIKOSHA

GP-100A Graphic Printer

Now a top quality graphic printer **at a price you can afford.** The **SEIKOSHA GP-100A – Terrific value** at under **£200** from **SPECTRUM.** Standard Centronics compatible interface for easy link-up with most micros. ■ Full graphics capability. ■ Printing speed 30 chars/sec. ■ Double width character output under software control. ■ Graphics, character and double width character can be intermixed on same line. ■ Paper width adjustable up to 10" – tractor feed. ■ Print position addressable by character or dot.

Spectrum LOW price £229.94 (Price Ex. VAT £199.95)

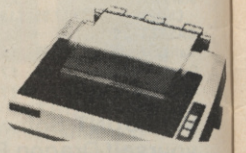
Cables and Interfaces available to fit most MICROS,

EPSON PRINTERS

Chosen by SPECTRUM for their reliability, the superb new **top quality** graphic printers from **EPSON.** New features include **super & subscript, underlining & deletion.** If you're looking for an **up-market** printer at a **down-to-earth-price,** call in and see the **EPSON** range at **SPECTRUM.**

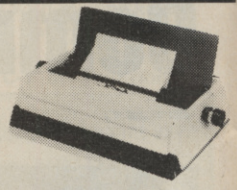
Model	EX. VAT	INC. VAT
MX80-T3	£329.00	£378.35
MX80 F/T Type III	£369.00	£424.35
MX100 Type III	£469.00	£539.35

Please see your SPECTRUM dealer for prices of INTERFACE/CABLE options.



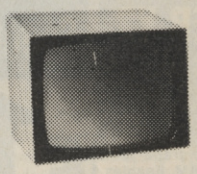
SMITH CORONA TP-I

The **smith corona tp-i** text printer is a microprocessor controlled high quality daisy wheel printer which delivers fully formed executive quality printout at a **speed of 120 words per minute.** It is a **LOW cost Daisy wheel** printer with Microprocessor Electronics, Serial, parallel or IEEE Interface.



ONLY £557.75
£485.00 ex. VAT.

ACCESSORIES



SANYO Colour Monitor
CDD3125N
ONLY
£228.85 inc. VAT
(£199.00 ex. VAT)

SANYO	Exc. VAT	Inc. VAT
SANYO 12" green monitor	£79.00	£90.85
Slim 3G Cassette Recorder	£26.04	£29.95
CTP 3131 14" Colour TV Set	£199.96	£229.95
C12 Cassettes	£0.43	£0.50
Single sided, single density disks	£1.70	£1.95
Double sided, double density disks	£2.94	£3.38
Single sided, double density double track disks	£2.57	£2.97
Disk head cleaner	£14.00	£16.10
Single part 11" x 9½" printer paper, box of 2,000 sheets	£11.35	£13.05

Spectrum Computer Centres have no connection whatsoever with the ZX-Spectrum Computer manufactured by Sinclair Research Ltd.

FREE!
£75 WORTH of software
with every **MZ80A** purchased

SHARP MZ-80A

Desk top genius! – the all-in-one SHARP MZ-80A. A personal computer designed with the serious user in mind. **ready to run the moment you get it home.** Built-in keyboard, CRT 9" display and cassette data storage with **48K RAM.** The BASIC with extra useful additions, offers quite a powerful micro for the home or business. ■ 4K Byte ROM + 48K Byte RAM + 2K Byte Video RAM ■ ASCII profiled keyboard + numeric pad ■ 2 page Video RAM allows screen to be scrolled up or down. ■ CP/M available

Spectrum LOW Price £546.25 Inc. VAT (£475.00 ex. VAT)

Floppy Disks and Accessories for MZ80A

Twin Floppy Disk Unit (inc. I/O Card, Disk, Cable)	£745.00	£856.75
Single Floppy Disk Unit (inc. I O Card, Disk, Cable)	£400.00	£460.00
Twin Disk Unit (only)	£590.00	£678.50
Single Floppy Disk Unit	£400.00	£460.00
Cable for F/D Drive	£25.90	£29.79

Printers and Accessories for MZ80A, MZ80B and MZ80K

80 Col Tractor Feed Printer inc. Cable, I/O Card & Rom	£415.00	£477.25

SPECTRUM FACTS
Maximum user RAM 32,000 Bytes approx.

NEW ACCESSORIES from SPECTRUM

	Ex. VAT	Inc. VAT
POINTMASTER Competition Joystick (For ATARI and VIC Computers)	£13.00	£14.95
VISCOUNT		
Motherboards for VIC 20 Standard (Use 2 or more cartridges at a time)	£21.70	£24.95
As above, with buffer	£26.00	£29.90
16K RAM for VIC 20	£38.22	£43.95
32K RAM for VIC 20	£58.22	£66.95
CURRAH CHATTERBOX		
Voice Synthesiser for VIC 20	£49.95	£57.95
Full Keyboard for ATARI 400	NOW AVAILABLE	

SINCLAIR ZX-81

SINCLAIR ZX . £49.95
16K RAM pack £29.95
ZX Printer . . £59.95

COMPUTER BOOKSHOP SOFTWARE FOR SINCLAIR COMPUTERS	INC. VAT
BUMPER 71K ZX81	£5.95
1K SUPER TRIO ZX81	£7.95
LABYRINTH 16K ZX81	£5.95
NIGHTMARE PARK/MUSIC 16K ZX81	£6.95
COMPUTACALC 16K ZX81	£7.95
PERSONAL BANKING SYSTEM 16K ZX81	£11.44
SPACE INVADERS/RESCUE 16K ZX81	£6.95
BREAKOUT 16K ZX81	£5.95
MUGSY 16K ZX81	£5.95
MERGATROYDS 16K ZX81	£5.95
PROGMERGE 16K ZX81	£5.95
FOOTBALL MANAGER 16K ZX81	£7.95

CASSETTES FOR ZX81	INC. VAT
TYPE—10	
6 GAMES	£3.95
JUNIOR EDUCATION	£3.95
BUSINESS & HOUSEHOLD	£3.95
SKILL & JUDGEMENT GAMES	£3.95
JUNIOR EDUCATION	£3.95
FAMILY QUIZ	£3.95
TYPE—20	
FANTASY GAMES	£4.75
SPACE RAIDERS & BOMBERS	£4.75
TYPE—30	
SUPER PROGRAMS Nos. 1-8	£4.95
TYPE—40	
BACKGAMMON*	£5.95
FLIGHT SIMULATION	£5.95
TYPE—50	
ENGLISH LITERATURE 1	£6.95
ENGLISH LITERATURE 2	£6.95
GEOGRAPHY	£6.95
HISTORY 1	£6.95
MATHS. 1	£6.95
MUSIC 1	£6.95
INVENTIONS 1	£6.95
SPELLING 1 (6-11 YEAR OLDS)	£6.95
CHESS*	£6.95
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GAMES NEWS

WATCH THE SKIES FOR DROPOUTS!

ALIEN DROPOUT

Alien Dropout sounds like a leather jacketed, drug smoking, heavy music freak from the outer reaches of the galaxy.

In fact there is nothing Bohemian about these Dropouts. They pursue a calculated scheme to colonise your planet.

The insect-like aliens swoop into ten columns at the top of the screen — building up their forces for the final attack. Once they fill a column with more than five aliens one of them swoops down — Galaxian style — and explodes on impact with the ground, throwing out deadly debris.

Armed only with a laser base your task is to shoot the aliens out of the columns before they amass sufficient numbers to swarm towards you.

The Dropouts are controlled by their leader — a giant butterfly-like alien who edges down the screen towards you when things are getting rough for his drone ships.

Alien Dropouts is based on the arcade game Zygon and is the latest addition to the Superior Software range of games for the BBC model B.

Also new from Superior is a fruit machine simulation with many of the features of the bar-room favourite such as hold, nudge, and gamble.

Both games are available now from the Leeds firm at £6.50 inclusive.

Illustrations: Jon Davis

OUT FOR THE COUNT IN CASTLEMATH

CASTLEMATH

You can't count out the Mad Maths Master of Castle Math.!

This is an adventure game where you can only make progress by solving sums set for you.

Once inside the castle, a variety of creatures pop up to set more sums to be solved and at different intervals. There are also a few surprises to keep your interest.

Castlemath is the latest addition to the Audiogenic range of software for the Vic, and is designed as a fun way of improving your maths.

Also new from Audiogenic this month is a novel game entitled the Pit. You play the part of a bewildered workman who has to go from one side of the screen to the other picking up money bags — all the time dodging a deadly deluge of hail which is pouring from the sky.

Castlemath is available from the Reading-based firm at £8.95 with The Pit at £7.95.

MANOEUVRES MADE EASY IN TEXAS

WARGAME

Wargames enthusiasts can spend hours setting up the battle and positioning their troops and armaments.

Now there is a quicker way to enjoy the battle without the danger of losing any of the pieces or completely taking over the living room floor.

Everything you need to play is stored on this latest computer program for the TI99/4a.

You can play against an opponent or pit your wits against the computer.

Each time you play the computer randomly generates a map, so each game should be different. The rugged terrain is made up of woodland, hills, marshes, and open plains.

Take it in turns to move one of your six guns to a new position or lob a shell at the enemy using the joystick.

You must move all six guns in turn and the computer will tell you which one to move by making it flash.

Wargames is the latest game from TX Software of Harlow. It is available on cassette at £6 from the Essex firm.

TX's golf simulation has been bought by Thorn-EMI and will be released with their range of TI software which will be launched later this year.

THOSE LITTLE GREEN FOOTBALLERS!

ALIEN SOCCER

If you are put off taking a journey to the stars because you would miss that one precious Earthling pastime — soccer, then this latest game for the Vic reveals an encouraging discovery about aliens — they play football too.

Alien Soccer is a weird combination of some of the best elements of soccer and pinball.

You control an alien Pat Jennings who moves from right to left trying to stop the ball from crossing the goal line.

Kick the ball up screen and it will rebound around a variety of obstacles notching up points for your team.

Alien Soccer is the latest game for the unexpanded Vic-20 from Rabbit Software.

Also new from Rabbit this month are Krells and Myriad — space attack games for the unexpanded Vic.

These latest additions to the Rabbit Coinless Arcade Collection retail at £9.99 from the Harrow-based firm.

MAN-EATER GUARDS THE CHALICE

CHALICE OF KALMAR

Your only guide in the quest for the Chalice of Kalmar are the occasional flashes of lightning which illuminate your way as you follow the winding path.

If you go off the path you will be pushed back outside the temple walls.

Just to make things a little more interesting you are also being pursued by a man-eating monster.

The B-side of this cassette has a second game on it called Penguin. This is a straightforward shoot 'em down game involving a penguin.

Chalice of Kalmar and Penguin run on the TI99/4a and are available from Apex software of Brighton at £3.95.

GAMES NEWS

THIS TOWN 'AINT BIG ENOUGH

HIGH NOON

It's high noon and the James gang are terrorising a sleepy western town.

Can you bring gun law to the streets of your unhappy town?

With your sherrif's badge gleaming in the bright sunlight you step bravely forward.

Who knows what may be lurking behind the shutters of the saloon, the undertakers, and the offices of the stagecoach company.

You'll need a quick finger on your trigger as the desperados appear from behind windows and walls to take pot shots at you.

But shoot straight as the good people of the town are also in hiding and a stray bullet could easily kill any one of them.

High Noon is the latest game from Abbex Software for the Sinclair Spectrum and runs in 16 or 48K.

Also new from Abbex this month is a classic Adventure entitled Austs Folley and a robot shoot-out game called Android Run.

All three games are available from the London based firm at £4.95.

CAN'T KILL A GOOD INVADER!

SPACE INVADERS

There's no getting away from Space Invaders — and a new version is due out this month for the BBC Model B.

Using Mode 5 colour graphics, these Invaders are an accurate copy of the classic arcade game and even feature an auto-play demonstration mode to attract attention when no-one is actually playing it.

Bug-Byte are also converting other arcade-proved games for the BBC micro.

City Defence recaptures the thrills of another arcade favourite, Missile Command.

In this game the skies are not filled with vapour-trails of descending missiles. A cluster of earthbound meteorites are headed down towards the cities.

The other difference is that the defence of the cities is undertaken by a steerable rocket which is launched by the player. Tactics in this game vary from the player who elects to defend all his cities to those who would rather concentrate on saving one from destruction.

Threshold is a BBC version of the popular Apple game of the same name.

Wave after wave of aliens have invaded the atmosphere and earth's defence is in your hands. The first wave trundles left-to-right across the screen with appropriate graphical and sound effects.

If you survive that one a galaxian-type wave heads down the screen towards you. There are 12 waves altogether, gradually increasing in deadliness.

All the above games run on a BBC Model B and cost approximately £8. They are available from Liverpool-based Bug-Byte.

Bug-Byte also has a Vic-20 offering due out this month. Vic Scramble is faithful to the arcade original and runs on a basic 3.5K machine for £7.

THE IDENTIKIT ALIENS ON THE RAMPAGE

GLADIATORS

A do-it-yourself alien kit is part of the magic of Galactic Gladiators.

This game of alien combat takes place in the deadly confines of a sealed off galaxy known as The Bubble.

You take the part of a leader of a troop of aliens who are your warriors. This troop is made up of identikit creatures with attributes like: strength, endurance, weapons, speed and skill.

These are given an armour-plating and weapons and sent off into combat. The stronger they are the more armour they can wear and weapons they can carry.

The game runs on an Apple II or III and comes from the U.S. company of S.S.I. under the Rapid Fire label. It is available over here from Pete & Pam Comers of Rossendale in Lancs, at a cost of £22.95.

Pete & Pam Computers also have another Rapid Fire Apple game in their warehouse at the moment. Cytron Master is set in a galaxy where all disputes are settled by robotic creations rather than human or alien life-forms.

These robotic warriors are known as Cytrons and those who pursue the life of commanding these creations are known as Cytron Masters.

At his command, a Master will have such things as: laser blasting cytrons, mine cytrons, guided missile cytrons and mobile bunker cytrons.

When two Cytron Masters are battling it out, their aim is to destroy their opponents' command centre. Only one top Cytron can survive.

The game is for two players or for one player to try and match the computer's cytron genius.

It is a fast and furious action game with three speed levels, so that beginners can learn the tactics. Cytron Master retails at £22.95.

EATING OUT DOWN AT THE SWAMP

SWAMP CHOMPERS

Swamp Chompers are not particularly attractive creations. But these mud-splattered inhabitants of the swamps of Muckedoo are your alter-egos in this new U.S. game for the Atari computers.

Between your character and its feeding station is a swamp infested with alligators and other terrifying creatures. Once you've left home, you have only 40 seconds in which to reach the feeding station and then return home.

If you make it across the swamp, jump into a flying machine to travel to your food which contains the magic ingredient to turn you into a swamp chomper, a creature capable of eating its former enemies.

The transformation lasts just nine seconds — and special bats emerge who suck the blood from swamp chompers during that time.

Ghosts also feature for extra chomping time. There are 13 different screens to build your score up, each getting more difficult.

It is available from Halesowen-based Centresoft on cassette or disc at a price of £21.95.

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4. ARROW OF DEATH (Pt. 2) — You now have the means to destroy your enemy... but you are far from home and this land is strange to you. Can you cope with the deadly perils which approach you and have you the strength to see your mission through to the final conflict?
5. ESCAPE FROM PULSAR 7 — Alone on a gigantic Space-Freighter... The rest of your crew have died horribly at the hands of a mutated Zoo-Specimen. Your only chance of escape is to reach the Frail Shuttlecraft. But the lurking Monster is hungry and you are the only food it has left...
6. CIRCUS — Your Car has run out of Petrol on a lonely road miles from habitation. As you trudge relunctantly down the road in search of help you are suddenly confronted by an amazing sight... in a nearby field is a Huge Circus tent! But this is no ordinary Circus as you will soon discover...
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* Adventures 5, 6 and 7 require 32K RAM

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GAMES NEWS

BEAT OFF SWARMS OF BUGS

BUG-OFF

There's a whole swarm of the nastiest creepie-crawlies all primed to ruin anybody's picnic in the new game Bug-Off.

Your character is armed only with a water gun and he must fend-off the bugs by squirting them.

Using a joystick, you can chase the bugs to any corner of the screen to finish them off.

The game is for a 16K machine on cassette or 24K disc and costs £19.50 for the Atari 400. It comes from U.S. software house, Adventureland and is distributed over here by Calisto Computers of Birmingham.

Out of the same stable comes Tootie Fruitie which is a Pacman-type game — but this time without a maze!

Instead of gobbling dots, Tootie Fruitie challenges you to fruit, ice-cream and sweets, as you steer clear of the bugs.

Available for the Atari in 16K cassette or 32K disc from Calisto, it also costs £19.50.

SECRETS DOWN IN THE DUNGEON

DRAGON LORD

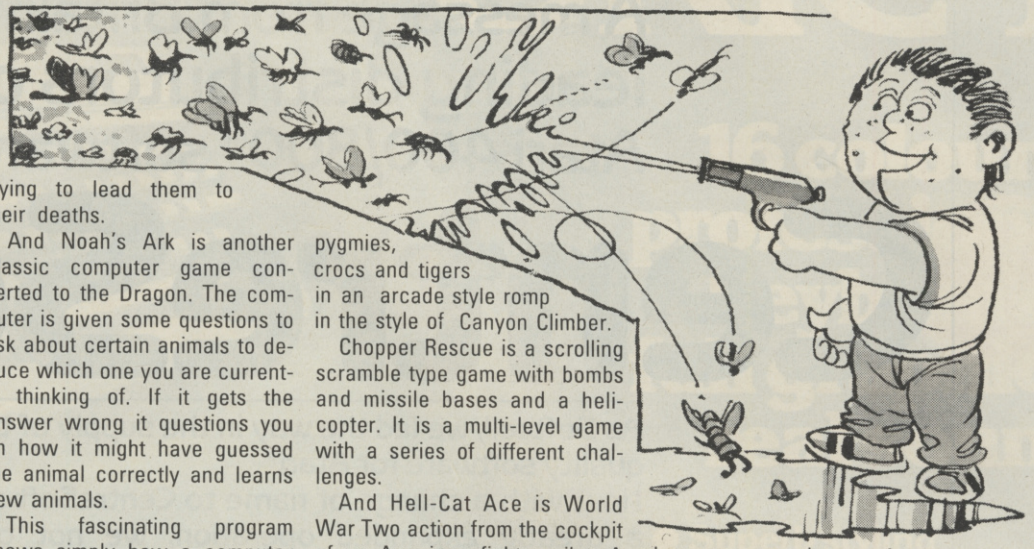
Dungeons and Dragons comes to computerised life on the Dragon in a multi-level adventure from the keyboard of Bob Chappell.

There are seven levels of dungeons in the Lord of the Dragon, all filled with some of the nastiest creatures you would expect to find in the dank dark places — trolls, hobgoblins and werewolves.

It is a combination of text and graphics from Item Limited, based at Fulmer, Buckinghamshire.

Other offerings from Item include a quotation quiz game, Who Said That with some 68 quotes to place.

Nightmare Park has you rushing about in a gloomy city park dodging the horrors and trying to lead them to their deaths.



And Noah's Ark is another classic computer game converted to the Dragon. The computer is given some questions to ask about certain animals to deduce which one you are currently thinking of. If it gets the answer wrong it questions you on how it might have guessed the animal correctly and learns new animals.

This fascinating program shows simply how a computer can be taught and gives an insight into the most basic artificial intelligence.

All the programs run on the Dragon 32 computer and cost £5.95 except Who Said That which is a little cheaper at £3.95.

A REAL MAN EXPLORES THE JUNGLE

FLOYD

It takes a man of real character to set off on a quest through a jungle infested by dangerous pygmies, hungry crocodiles and man-eating tigers . . .

Such a man is Floyd of the Jungle and his mission is set among tropical vegetation in the Atari 400. He is tackling the jungle to save his girl from the pygmies, crocs and tigers in an arcade style romp in the style of Canyon Climber.

Chopper Rescue is a scrolling scramble type game with bombs and missile bases and a helicopter. It is a multi-level game with a series of different challenges.

And Hell-Cat Ace is World War Two action from the cockpit of an American fighter pilot. A flight simulator with plenty of Japanese rivals to tangle with above the Pacific Ocean.

These three games all run on the Atari and come from Micropro Software in the U.S. They all cost £29.50 and are available from Calisto Computers in Britain.

Calisto has also commissioned a U.K. Battle-of-Britain version of Hell-Cat Ace, called Spitfire Ace which should appeal more to the U.K. audience.

THE MANY ARMED MONSTER . . .

BLACK SQUID

The Black Squid is a game of memory and menace on the seashore.

It's a shore you may never see again as you swim desperately through the rocks and giant clams, dreading the tap of a black tentacle on your shoulder.

The rocks are invisible in the murky waters, but everytime you hit one, that particular rock and all those you have previously hit flash up on the screen for a second.

Memorise their position if you can because rocks distract the squid and if you can lead the dark beast into a lot of them, you'll have a better chance of making it to the seashore at the top of the screen. The giant clams are more dangerous.

The Black Squid needs at least 8K or RAM expansion on the Vic-20 and it costs £9.95 from Preston-based Channel 8 Software.

Also new from Channel 8 is a children's game of I-Spy which is aimed at the learning to read age-group. There are 10 topics in the text-based game, from which a child can choose to spy.

Among these are I-Spy at the : zoo, circus, farm, shops and high street. Like the children's game, the computer gives the player a letter and asks it to guess what could be seen beginning with that letter at the given situation.

It retails at £9.95 and runs on the Atari 400 and 800.

Illustrations: Jon Davis

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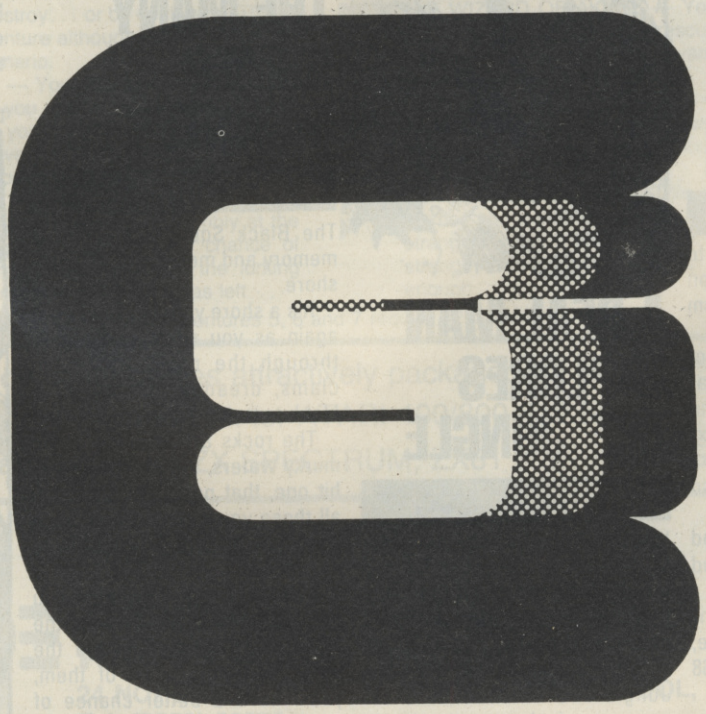

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OUR TOP COMMANDER

Top space commander for turn one is Nicholas Tacticos who will be able to plan out future campaigns on a Colour Genie microcomputer.

The Spartans' space fleets under Nicholas' control made full use of the Plunder command to notch up top profits of **2,586** points.

The Spartan pirates raided routes between Tubox and Dusup, Widan and Barov, Jinis and Rivev, Soner and Widan, Widan and Opod to boost the score up.

Our top 10 scorers for the first turn were: Nicholas from Sinclair Road, London W1; J. Pedley, Cambridge, **2374**; D Mack, Farnborough, **2143**; C Jennings, Tonbridge, **1992**; A Youde, Leigh-on-Sea, **1907**; P Nevins, Warrington, **1845**; S Jones, Sheffield, **1795**; P Schafer, Hythe, **1730**; M Grant, Marden, **1652**; and C Parker, Carshalton, **1628**.

Other players didn't fare so well. But check up your own scores and the following list should show you how you fared: 126 players scored 500+; 24 players were between 400 and 499; 46 between 300-399; 48 between 200-299; 75 between 100-199; 461 between 0-199; and 1130 players finished up making scores below 0!

Nicholas takes a Colour Genie for his carefully considered Plundering of us poor merchants. The rest of you can lick your wounds and try to improve your scores on this next turn. We have all got a clean sheet to start our March turn.

For the March issue's individual winner we will provide three cassettes of games programs for his machine. Be it games centre or computer.

Mike Singleton, who wrote the Seventh Empire program runs his own Play-By-Mail game, Starlord. And he is offering a free rule book and two free turns of Starlord to any Seventh Empire player. Just write to Mike at the address given in the Seventh Empire Rulebook and quote your Seventh Empire code number for an introduction to the galaxy of Starlord.

THE WONDER OF COLECOVISION

If you're a fan of our Video Screens section you'll already have read about the new Colecovision Video Games system and how its graphics are going to change the face of TV games centres.

Now, through Seventh Empire we're offering you a chance to see these marvellous Colecovision games at first hand in their own home.

A Colecovision plus software is the prize for the overall winner of our Seventh Empire competition. How long the Seventh Empire runs in *C&VG* depends on how popular it is, but if it is still being included in September of this year we'll present the Colecovision to the player who has notched up the most points by then.

As the first turn was really just a chance to get to know the game and for us to check out the running times, the scores from that turn will not be included. So starting from March the computer will add your scores and the top scorer by the time our August issue's turn has been processed will have won a Colecovision.

With 32K of Rom and 17K of Ram, the Colecovision is closing the gap between TV games centres and microcomputers. It offers some marvellous detail in the graphics for several already successful arcade games which it features in its software catalogue. Its versions of Donkey Kong, Zaxxon, Lady Bug and Turbo are bound to be top sellers for the Colecovision. Venture is not such a well-known arcade game in this country but with its dungeons and dragons theme it will also capture hearts.

A worthy prize for our space fleet commander.

CHECKING YOUR ORDERS

Did you enter your Seventh Empire orders correctly? About 30% of you had some teething problems understanding the rules of movement and entered a few invalid moves.

Usually it was only one or two fleets that went astray. But if these stay "lost in space" it will affect your tribe's profit margins each turn.

So before you enter your fleet positions for turn 2 check your fleets for turn 1. If you have made any mistakes for a fleet, these will have been converted into Stay orders, in both Movement Phases.

Most common problems were from people not checking both orders against the Diplomatic Diagram to see whether they were at war or at peace with the empire they hoped to Attack, Trace or Move to.

Remember a Trade or Move between warring empires cannot take place in one turn — even via a neutral empire.

A word of warning about the Galactic Map this month as it only includes star numbers for players who took part this turn. Approximately another 10,500 fleets will be added to the March figures randomly, before the next turn is processed.

The Raid Penalty for this second turn is "2".

And the deadline for orders is **Wednesday February 23rd** so hurry them into us.

Only one player has an Imperial Ship this turn. Colin Jennings is in charge of the Dead Empire's ship for March.

Below is the Gateway Route profits table. The figures printed in white on black are the routes in which Plunderers made a profit. The black on white figures are routes on which Cargo runners made a profit. The table should be read by looking up the star you left in the vertical table and checking it against the star you moved to horizontally. The resulting figure tells whether the route profited pirates or merchants.

If you still haven't entered The Seventh Empire you will find a form on page 11. Send all Seventh Empire correspondence to: The Seventh Empire, Computer & Video Games, 8 Herbal Hill, London EC1R 5JB.

	As	Ba	Ca	Du	Er	Fa	Ga	He	Ix	Ji	Ko	Li	Mu	Nu	Op	Pu	Qa	Ri	So	Tu	Us	Va	Wi	Xu	Yu
Asol		111		500	500	1000	500	500	83	1000	1000	250	500	125	166	1000	250	111			500		250	1000	
Barov	1000		111		1000	1000	500	333	333			500			1000	111	500		62		1000	500	166		1000
Cazuv	1000	500			1000	500	1000	1000		1000	250	500	500		250	166			333	1000	50	1000	1000	1000	1000
Dusup	500	500			1000		1000	1000	111	250	250	333	200		250			166	250	250		250	1000		1000
Erak	1000	111		1000			500		1000	142	1000	100	62	500	500		250		1000	1000	1000	500			
Fadis		1000		1000	111		111	111		166	1000	500		1000		500	1000	500	1000	500	111	111			333
Gazor		500	111	250		500		62		500	1000	250	166			333		1000	250	1000	111			333	1000
Hezod	200	111	1000		500		500			27		1000	125	83		125	1000	333		250	250		1000	250	
Ixip		500		500	250	500				166	1000	142	1000	500	166		1000	1000	83	250		500		1000	
Jinis				111	83	1000	1000		200			1000		1000		333	1000	1000	1000		100	1000	500	41	1000
Kolol	500	250	1000	333	1000		500	500		111		333	250	1000	500	1000				1000		166	250		1000
Lizag	1000					1000	500		250	333				50	1000	250	250	1000	1000		200	1000		250	
Mupip		250	166		1000	250	500	1000		50	250			62		250		1000	1000		500	500		1000	
Nuzet			166				500	333	500	333	1000	111	250		500	1000	1000	1000	1000	62	50		166		1000
Opod	111		1000	111	250	500	1000	200	100		1000	125	1000	1000		166	111	500	1000	62		1000			500
Pulud		500	166		250	333	1000	250		1000	500	500	1000	111					250	250	1000		250		500
Uavuv	333	166		250		333		250		500	500	250		1000	500			1000	500			500	250		500
Rivev	125	166	1000	250	1000	111	500	500	166	1000					1000	500	500		111	333	250		500		
Soner	500	166	500	500	1000		250	500	333	500		333	125	1000	1000	333	166	500		333		250	166		1000
Tubox	125	333	250	500	250	1000		500		333	250	333	250	250	125	250			1000		1000	250			
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Widan	166	62		111		1000	500		500	200	83		1000	1000	1000	333	166	111				500			
Xugod	500		500	500		250				100		166	1000		1000	333						500	1000	1000	250
Yuses	62	1000	250	333	250	1000	500	166	1000		1000	500	500	333					500			142		250	1000

ITH EMPIRE

BATTLE REPORTS

Sixty battles raged in the galaxy last turn and all were successfully repulsed.

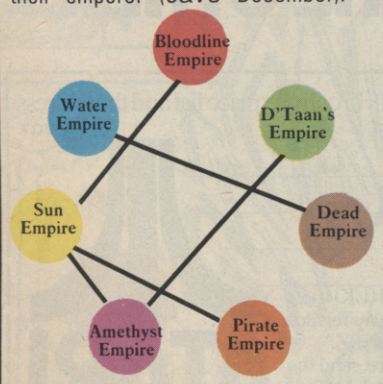
The most one-sided battle took place at Ixip where 272 defending fleets from the Sun Empire destroyed one attacking fleet from Bloodline-controlled Jadeg.

The closest contest was at Olex where Pirate Empire fleets stormed in and 94 attackers were narrowly defeated by 107 defenders. With the state of the Diplomatic Diagram this turn Olex may well fall earning rich pickings for the attackers.

Several defending fleets suffered damages to the better mounted attacks and notes of all bonuses are included below: **Xokeg:** defenders suffered −1 loss; **Soner:** defenders' loss −2; **Vepoz:** —2; **Rurus:** —2; **Naxig:** −2; **Olex:** −1; **Okap:** −1; **Jadeg:** −5; **Kepar:** −1; **Yuses:** −2; **Sidal:** −7; **Hakub:** −2; **Minep:** −1; **Girex:** −1; **Otan:** −2. The heaviest loss for the defenders came at **Meden** where the Sun Empire attackers from poor Rorul shared out a deficit of −11 among the defending forces.

Only three star system defenders salvaged a profit from their successful defence: those at **Apel** earned a Battle Bonus of 1; the **Rolek** defenders added the energy of rich Minep attackers to their score, a Battle Bonus of 1 and **Tuxus** defenders also added one to their profits.

The only significant change in the Diplomatic Diagram below is that the Bloodline Empire and the Dead Empire have negotiated a peace treaty — finally forgiving that Ice Warrior for murdering their emperor (*C&VG* December).



The Diplomatic Diagram

FOZUZ ○ 71 466	LARUB ♦ 109 156	YIBET ♦ 129 182	XOLIP ♥ 129 150	ITIL ♥ 110 156	FUNUS ♥ 119 134	LULIP ♦ 69 243	YANOK ♥ 129 123	XOKEG ♦ 124 202	ISOX ○ 83 248
VIZAX ○ 80 246	QIRUS ♥ 174 90	HAZAN ♦ 96 176	ABOB ○ 115 119	SONER * 239 59	VEPOZ ♥ 109 195	QATOT ○ 101 122	HEZOD * 217 32	ASOL * 223 74	SUXEK ♥ 188 80
BAROV * 184 80	WIDAN * 179 64	RURUS ○ 102 202	MUPIP * 222 56	NAXIG ○ 100 200	BETID ♦ 98 167	WAVAB ○ 90 183	RIVEV * 182 33	MEGUD ○ 126 133	NABOK ○ 91 282
DALIX ♥ 100 169	OLEX ♥ 151 116	TASAT ♥ 122 123	CAZUV * 166 80	GOVAX ♥ 160 82	DITUG ♦ 136 124	OKAP ♥ 161 125	TOXAZ ♦ 73 384	CIXAN ♦ 100 236	GOTEG ♥ 109 121
ERAK * 154 71	KOVEP ♦ 113 163	USUG * 258 30	PEBOB ♥ 113 138	JADEG ♦ 118 162	ENAK ○ 119 178	KEPAR ♥ 141 125	UGON ♦ 144 92	POROV ♦ 89 185	JINIS * 242 62
FADIS * 112 228	LOKIK ♥ 178 101	YUSES * 141 103	XAPUS ○ 89 225	IXIP * 273 37	FAGIL ♥ 173 82	LIZAG * 183 63	YODAZ ♦ 104 175	XUGOD * 173 69	IBED ♥ 129 102
VASUX * 132 71	QUXIN ○ 100 169	HIPEB ♦ 139 126	ASOR ○ 103 170	SIDAL ♥ 133 178	VIZET ♦ 100 186	QAVUV * 185 75	HAKUB ○ 96 166	APEL ♦ 111 533	SABAG ♥ 130 110
BUREP ♥ 123 77	WAGAP ♥ 141 110	ROLEK ♥ 155 112	MINEP ○ 76 357	NUVEX ♥ 127 100	BAZIX ○ 125 119	WUPIV ♥ 108 140	RORUL ♥ 129 91	MEDEN ♦ 96 200	NUZET * 137 131
DUSUP * 143 116	OPOD * 152 75	TUBOX * 145 136	CIGER ○ 113 161	GAZOR * 249 76	DABAG ♥ 164 88	OTAN ♦ 93 159	TUXUX ○ 104 241	CESER ♥ 194 96	GIRIX ♦ 75 327
ELAR ○ 101 110	KERUP ♦ 102 170	ULEB ♥ 120 138	PIRAD ♥ 132 106	JAXEL ○ 98 108	EDIB ♦ 87 220	KOLOL * 151 94	UKOP ○ 75 185	PULUD * 210 76	JUVAK ♦ 90 135

The Galactic Map

Orders in Block Caps please

Name: .....

Code No: ..... Telephone No: .....

		1st Movement phase		2nd Movement phase	
	AT	ACTION	STAR	ACTION	STAR
FLEET 1					
FLEET 2					
FLEET 3					
FLEET 4					
FLEET 5					
FLEET 6					
FLEET 7					

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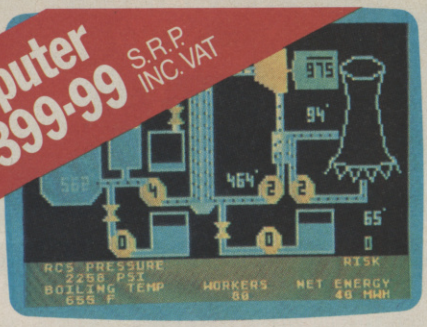
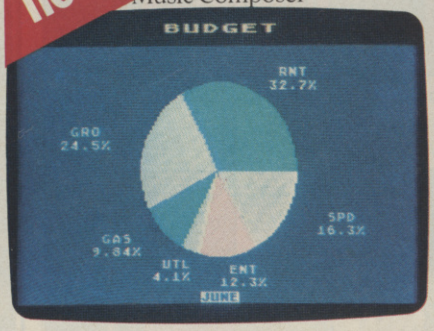
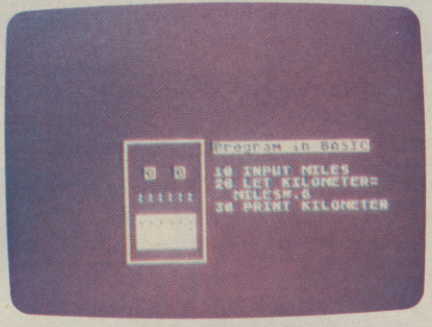
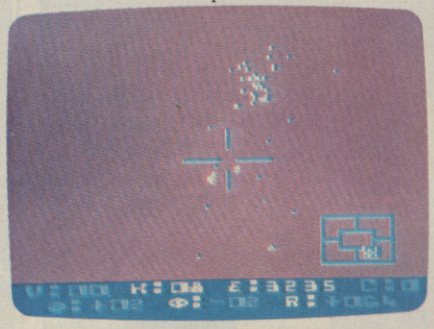

Scram



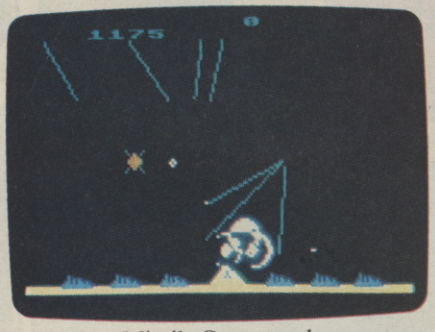
Graph-it



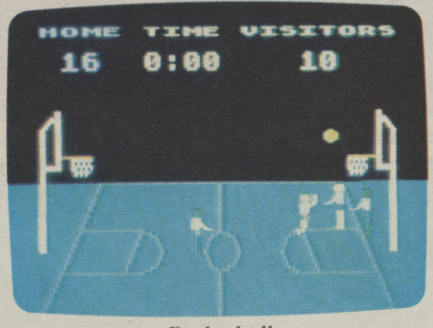
Intro to BASIC 1


Star Raiders

European Countries



Missile Command



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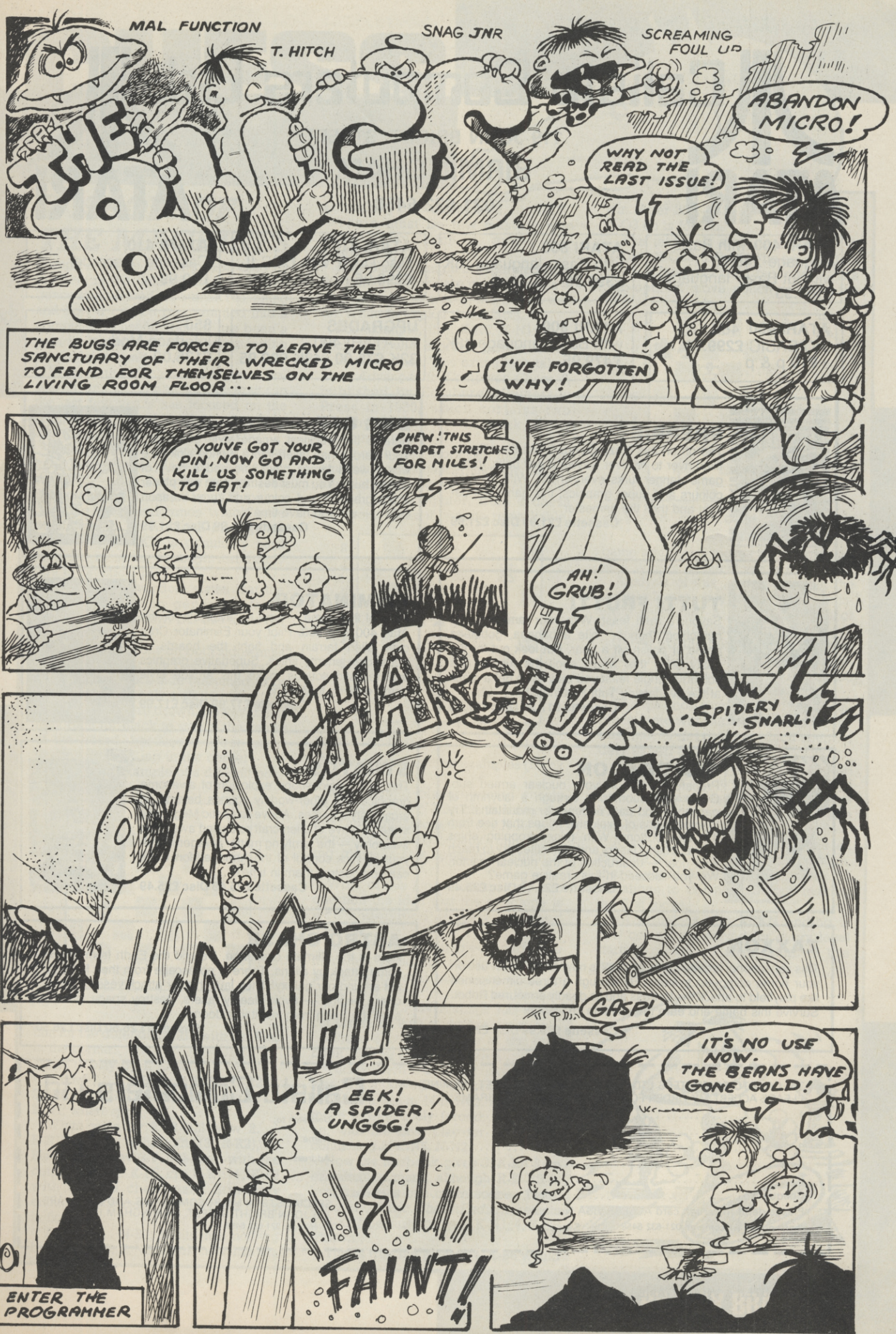
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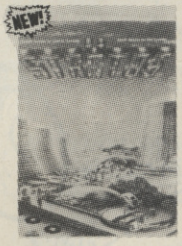

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CHESS

WISDOM OF THE MACHINES

Computer chess has long been used by workers in the field of Artificial Intelligence as a testbed for human reasoning and how it can be programmed into a computer. A useful spin-off has been a gain in knowledge and understanding of the game itself.

Work at the Machine Intelligence Research Unit at Edinburgh University in the last few years has focused on the endgame King and Knight against King and Rook (abbreviated to KRKN).

Amongst those studying this ending have been two players of master strength — the Yugoslav player Ivan Bratko and U.S. master Danny Kopec.

Unlike most endgames which have been studied by Artificial Intelligence researchers, KRKN is genuinely hard even for masters, although fortunately rare in practical play.

Conventional wisdom states that the ending game is in general a fairly straightforward draw, but this turns out not to be true.

As the game goes on both sides must take care to spot any possible forks.

With the Rook's side (assumed to be white) to move, only a slight majority of legal positions are drawn. However, it is important for Black to stay in the centre of the board, because the won cases occur with the King in the corner.

Here is an example of a difficult posi-

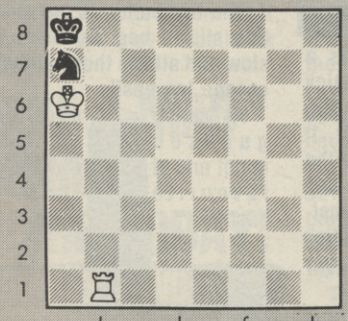


FIG 1

tion for the defending side with the King in the corner.

White to play by 1. K-N6!

If now 1.... N-B1ch; 2. K-B7, N-R2; 3. R-N8 mate. So Black must play 1.... K-N1; whereupon

White wins by 2. R-N2! Now 2.... K-R1 allows a lethal pin, (3. R-R2), so Black must play 2.... N-B1ch; with the continuation 3. K-B6 ch, K-R1; 4. K-B7 with a rapid checkmate. Strangely enough, Black can draw if it is his move in figure 1.

After 1.... N-B1; White has nothing better than 2. R-N3. Black now has the astonishing drawing move 2.... N-K2!

There must be few masters who would play such a move with confidence.

Now Black's Knight is separated from the King and there are mating threats to contend with. However, there is no way for White to exploit these facts.

For example, if 3. K-N6, K-N1; 4. K-B5ch, K-B2 with a drawn position away from the corner. This example is taken from *Advances in Computer Chess 2*, published by Edinburgh University Press in 1980, which contains two lengthy articles on the work of the Edinburgh team.

Although their work had much more ambitious goals concerning how expert knowledge might be represented and stored in a computer, from a chess viewpoint alone it is quite remarkable.

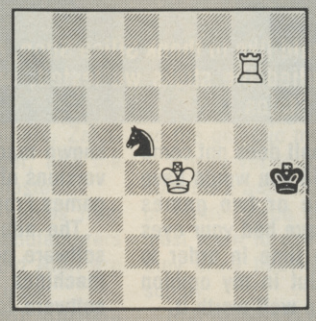


FIG 2

Here is another of their examples (Black to move).

Most strong players would surely now play 1.... N-KB3 ch to bring the King and Knight together (by N-R4 subsequently). However, Black's only drawing move is the apparently suicidal 1.... N-QB6ch.

Work of this kind calls seriously into question the idea that the endgame is well understood at least by grand masters.

Even for this four-piece endgame there are numerous previously unsuspected problems and even such an apparently definitive to me as Reuben Fine's *Basic Chess Endings* has clear-cut errors as well as severe omissions.

Figure 3 is an example of the textbook lapsing (Black to move).

This position is a variant of one which was first analysed in the ninth century. White can win in 14 moves. Black's first move is effectively forced: 1.... N-R4 ch; with the best play for both sides continuing 2. K-N5, N-N2.

Now the textbook gives 3. R-KB 8 an exclamation mark, although R-K R5 is best and wins one move sooner. More seriously, *Basic Chess Endings* rejects 3. R-KR7 because of 3.... K-N1; 4. K-N6 "drawn".

This is true but playing 4. K-B6 would win. After 3. R-KB8, Black's reply 3.... N-Q3 ch is forced.

The textbook analysis continues 4. K-QB6, N-QB5; 5. R-Q8! The exclamation mark is Reuben Fine's, but in fact it is a sub-optimal move which extends the

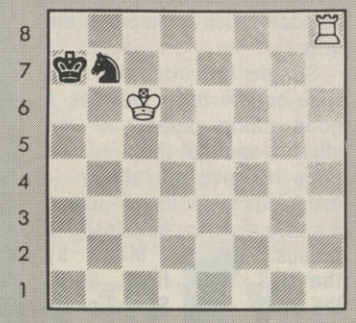


FIG 3

game a further 6 moves than necessary until White's eventual win is reached.

Analysis of this kind shows that the textbook not only occasionally misjudges whether a position is won or drawn but frequently gives a move which is not the best. If this is the case with a four-piece endgame, the infallibility of the rest of the textbook must be open to suspicion, to say the least!

The question remains, how is it possible to write with such confidence of the best moves in positions which seem to defy expert analysis?

Certainly the answer is not by analysing the game out to a conclusion each time. There are positions where it takes White 27 moves to win (i.e. 27 White moves plus 26 Black moves).

Assuming that each player has an average of 10 moves in every position, there would be 10 to the power 53 variations to consider before making the first move.

Nevertheless, the KRKN ending is now completely solved for every legal starting position. I shall return to this topic next month.

BY MAX BRAMER

VIDEO SCREEN

Getting the right joystick for your TV games centre is becoming as difficult as choosing the right squash racquet or set of golf clubs.

Adverts claim all sorts of things for sticks — that they will increase your scores and turn you into a pro-player.

We have already reported on the latest batch of souped-up sticks now being imported into this country from the States and this month the C&VG staff sat down at our Atari VCS and played a few games using the sticks — purely for research you'll understand!

Here we bring you the results of our bench-tests on four of the new sticks — plus the novel Wico Trackball and the simple but effective Byte Stick-Stand.

Our general impression was that these sticks add a great deal to your game and will prove a valuable addition to your games centre.

Most of the sticks we tested were in the £15 - £25 price range — less than one of the top of the range VCS cartridges. Pretty good value in our humble opinion.

We would like to thank Silica Shop, of Sidcup, Kent, who supplied the sticks we tested, and import them from the States.

STICK-STAND

The Stick-Stand was the cheapest and simplest product we tested. Basically it's a plastic stand into which your standard Atari joystick fits snugly. You also get a little red ball which slips onto the top of the standard stick to improve the grip.

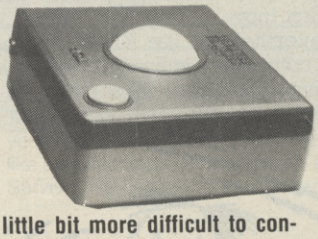
Simple but effective. The wide-bottom base provides a good stable support for the stick — and that little red ball does improve playability — especially when the on-screen action gets fast and furious. Made by the U.S. firm Byte, the Stick-Stand costs £7.95.

TRACKBALL

The Wico trackball is truly a video games gourmet controller.

Once you get used to this unusual method of control and develop some speed, it gives you unbelievable responsiveness and adds greatly to playability of any game.

Left and right commands are fairly easy to master but up and down movements are a



little bit more difficult to control. You will have to readjust your Pacman technique accordingly!

My one reservation with the trackball was with the fire button. This was particularly heavy and clicked unnecessarily every time you released a missile.

It would also have been an improvement to have a fire button in the top right hand corner as well as the top left for left-handed people.

The trackball does not come cheap. At £48 you would have to forgo one or two games which you have had your eyes on for some time in order to pay for it. But in my opinion this would be well worth it.

DATABASE

If you are the proud owner of an Interton VC4000, Radofin, or Acetronic video games centre then you might not be quite so proud of the ever decreasing range of games available.

As these little-known machines have not generated the mass sales of, say the Atari, Phillips or Intellivision machines there is not a large enough owner base to support independent software. It also means that the firms who produce the machines do not tend to produce a very wide range of games themselves.

The situation has been improved slightly by the production of an adaptor from Voltmace which enables all software for the Database system to be played on any of the above machines.

The range of games for the Database is probably about the most up to date of these lesser known machines and includes versions of the popular arcade games Frogger and Pacman.

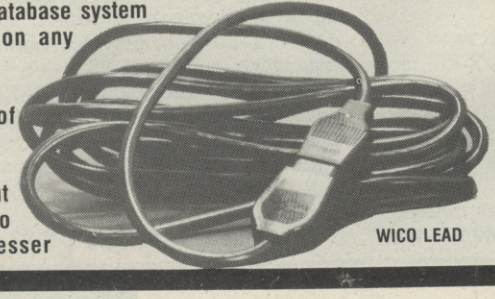
The adaptor plugs into the software ports on the various machines and the Data base software is then inserted into it.

The adaptor is available at £4.50 from the Baldock, Hertfordshire — based firm.

LE STICK

Le Stick from Datasoft is a really nice idea. A joystick without a base seems the easiest way to describe it. It works when the player tilts the stick in the direction he wants to move, and a pressure sensitive "switch" inside the stick freezes the action if the player squeezes it gently.

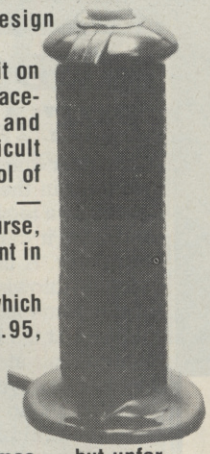
As I've said before it's a really nice idea. However in practice — on a video games centre anyway — it's just not responsive enough. You really need a lot of practice to get it working as well as one of the regular design sticks.



WICO LEAD

We tested it on maze and space-type games and found it difficult to keep control of the action — which, of course, is all important in TV games.

Le Stick, which costs £24.95, may come into its own when it's used for computer games — but unfortunately our testers just couldn't give it the *C&VG* seal of approval — despite the nice design concept.



STAR FIGHTER

Suncom's Starfighter is described by its makers as the ultimate joystick. Well, in our opinion, despite the two year warranty that comes with it, the stick fails to come up to this extravagant claim.

The Starfighter stick is short, stubby and difficult to get a good grip on — you'll soon be suffering from Astro Fighter thumb or some such affliction that all video game players suffer from time to time.

The fire button is not one of this stick's best features. It's slow and allows those aliens to escape too easily.

As you've guessed probably is not one of Starfighter *C & V G*'s favourite sticks. It costs £19.95.

WICO STICKS

The Wico Command Control range of joy sticks are the best known "gourmet sticks" as they are termed in the U.S., where they are currently the number one sellers.

There are two sticks in the range — the Red Ball stick and the Extended Lever stick.

Both are highly responsive

VIDEO SCREEN

and offer you a choice of two fire buttons. One is mounted at the top of the joystick itself and the other at the base for those of you used to blasting away with Atari sticks. The Red Ball joystick is the dearer of the two at £27.95. The Lever stick is £6 less — which I feel was not reflected in extra responsiveness.

Both Wico sticks are compatible with Atari VCS, Atari 400 and 800 and the Commodore Vic-20.

An adaptor enables the sticks to be plugged into the T199/4a, Apple and TRS-80 home computers. Wico also produce an extension lead for their sticks which is useful for those people who like to sit in their armchair and play. It sells for £5.95.

TAKE A MAD GORILLA HOME TODAY!

DONKEY KONG

If Mad Mario, a crazy gorilla and a beautiful blonde mean nothing to you then you have not played Donkey Kong.

This hit arcade game is now available in cartridge form for Atari VCS owners.

A couple of shops who managed to get hold of advance copies of the game before Christmas sold out in a matter of days. Coleco have promised fresh supplies for March.

For the uninitiated you play the part of Mad Mario who is trying to rescue his girlfriend from the clutches of a gorilla.

To get to your girl you must run along steel girders and up ladders while hopping over barrels and fireballs that the gorilla is throwing down at you.

Donkey Kong is one of a range of well known arcade titles which have been taken out of the arcade and converted to VCS format by the new video games company Coleco.

Also released this month are Gorf — a space attack game.

Wizard of Wor takes you down into the dungeons where you have to outwit and vapourise the wizards monsters. You have a radar device to help you negotiate the constantly changing maze.

Carnival is a simulation of a fairground shooting gallery. Blaze away at the clay pipes, dancing bears and sitting ducks.

The Coleco range of VCS games will be available from most major video games stockists at around £28.

Coming soon are Zaxxon, Turbo, Lady Bug and Cosmic Avenger.

Most of Coleco's titles will shortly be available for the Intellivision machine and also for ColecoVision's own machine which will be launched in the Spring.

This year hundreds of cartridges for TV games centres will go on sale. Not just new and original games but new versions of old favourites.

The Atari VCS will continue to get the majority of the new releases as more people own Atari centres than any other machine and therefore there are greater potential sales.

To help you make the best choice when buying a new game *C&VG* will be reviewing similar games in one batch and picking the best one.

GO WHERE OTHERS FEAR TO FLY

STAR RAIDERS, STARMASTER, STAR VOYAGER

Nowhere is the competition for sales tougher than deep in space. You can do battle with the Krylons of Star Raiders, Zakorians of Star Voyager, and the Starfighters of Starmaster.

These 3D space games from the big three VCS manufacturers Activision, Imagic and Atari are based on the same idea.

You pilot a craft hurtling through space at breakneck speed. Your mission is to seek out the enemy ships and destroy them while avoiding their fire and protecting your Starbases.

The first cartridge I plugged in was Atari Star Raiders.

This is an impressive package complete with a touch-pad which plugs in to the right hand joystick socket on your VCS, and operates in conjunction with the joystick.

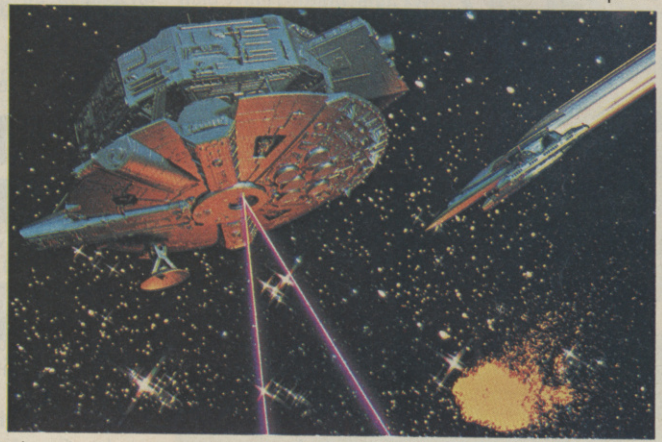
The touch pad controls five flight functions whilst the other joystick steers the ship and fires your photon torpedoes.

You can call up the galactic map to see your position, your starbase, and the whereabouts of the Krylons. By pressing fore view you go back to the view from the cockpit of your ship.

Hyperwarp sucks you through the galaxy at great speed to the space sector you have selected on the galactic map.

The novel touch-pad add-on controls a tracking computer and protective force field, which you must learn to use selectively as they draw heavily on your fuel supply.

Star Raiders is a most playable game. Difficult but addictive. At first it requires a lot of effort to master all the controls.



Imagic's Star Voyager is much easier to get the hang of.

Apart from the oncoming aliens there are only three other controls to be watched — radar screen, energy level, and the number of enemy hits.

Star Voyager is also easier because the aliens come at you in a uniform corkscrew movement as opposed to the random dodging of Starmaster and Star Raiders.

Star Voyager does have one unique feature. Every so often you get an audible signal telling you a star portal is in close proximity.

You must fix your sights on this and fly towards it.

As you get nearer the tiny square will grow larger and larger till it fills the screen which then flashes through a sequence of colours. When this is done you have then passed safely through a star portal.

Activision's Starmaster is the closest to the Atari original with a galactic map and an excellent super-speed simulation.

Starmaster has the best attack computer display of the three games. As you fly into a sector occupied by enemy ships the control panel turns red. Hits on the enemy cause the screen to flash red. Yellow flashes mean the enemy has scored a direct hit on your craft.

Starmaster and Star Voyager both retail at around £25.00.

For game presentation and sheer game play Star Raiders at £29.95 is the best of the bunch. Although Starmaster gives the toughest fight.

ARCADE

PIGGIES IN THE MIDDLE

TIPS ON AMIDAR

The secret of success at maze-chase games is knowing what to expect of your pursuers.

In the two screens of Amidar, the chasing warriors and cuddly toys are more predictable than most arcade pursuers — one goes around the outside of the rectangle filled screen (the tracker) and the other four (the Amidars) turn each time they come to a corner.

Amidar is a game of screen filling. A network of staggered rectangles provide the lines for your gorilla to travel on and each time you paint around a square it fills in, adding to your score.

The first screen Amidars are warriors and your best tactic is to go to the bottom left-hand corner and clear that area. At this point all the Amidars are on fixed routes and remain so until you reach your next objective, the top right corner, when they all begin to follow you as best they can.

Fill this corner while the tracker is at the top of the screen and follow it around the edge closely. Then Amidars won't cut in between you and the tracker.

It will lead you to the top left-hand corner. Clear that area and head for the screen centre to do the same there, before moving to the final corner.

Leave the square in this corner until the Amidars are surrounding you, then complete it. This will have the same effect as eating a Pacman energiser — the Amidars will turn blue and turn tail and can be eaten for bonus points.

Don't blindly follow them, they are not any slower but aim to meet them head on. A dead Amidar falls to the bottom of the screen and if it hits you on the way you'll lose a life.

You have now earned a bonus screen, consisting of a rough maze connecting a female Amidar, pink, piggish cuddly toy, at the top of the screen and a bunch of bananas at the bottom. Press the "jump" button as the pig reaches the entrance that leads to the bananas, for a 5,000 point bonus.

Amidar's second screen proper turns you into a paint roller. The Amidars and tracker are all pink pigs and you can only get points for squares connected to one-another.

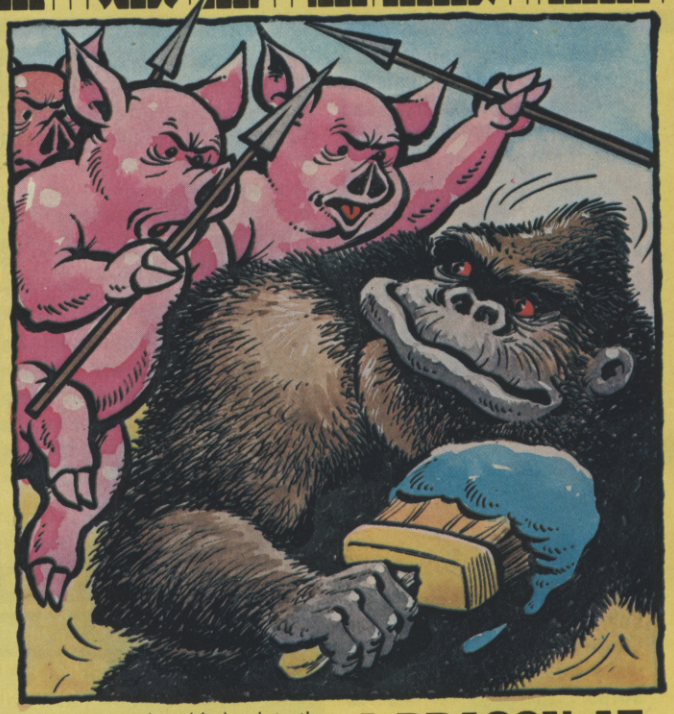
Start by going right up the middle of the screen for 2,740 points. You can then go to the four corners to turn the pigs yellow and chomp up a bonus.

If the tracker comes off the outside loop during this screen, beware! Any second she is going to slip right onto your tail and stay there. Every time you clear all three screens, you get a 2,000 point bonus, then it's back to the first screen with an extra Amidar.

The "jump" button causes the Amidars to spin for a second and you can then pass through them. Press it only when right next to one, on a collision course and don't hold the button down, it repeats.

You only get so many jumps each screen and you cannot afford to waste any of them. So, be positive.

Extra lives come at 50,000, 70,000 and every 500,000.



BLINK AND DON'T MISS

EYES

If you don't like being watched, you're in for a nervous time when you play Eyes — because they're everywhere!

Small eyes haunt the screen maze, while their larger compatriots roam at will and if they blink, you may well have looked your last upon this life.

You also resemble an eye-like creature in this game and your task is to eat as many of the smaller eyes (Pacman fashion) as you can while travelling around the maze and clear the screen.

When confronted by a larger specimen, your options are to fire quickly before it can turn to look in your direction or dodge out of its line of sight.

Missiles from the eyes travel in a straight line. And while they do travel faster than you can run, death is hardly instantaneous. It is possible to dodge around a corner and watch it pass harmlessly by.

The secret of survival is not to get caught on a long corridor a few inches away from the nearest exit and not to be tempted to fire at an eye in the mistaken belief that its death will stop the oncoming bullet . . . it won't.

The only safe way to fire at eyes, is before they have fully turned a corner.

The game is played at a leisurely pace and appears a lot easier than it actually is. Killed eyes return to hunt a few brief seconds later and materialise on the outside corridors — so keep an eye out for them.

A DRAGON AT THE END OF THE TUNNEL

SUPER ZAXXON

Super Zaxxon takes the graphics of its predecessor and improves the game.

You still have to attack the blue space fortress, watching your shadow and altimeter to gauge position and height above the deadliest of arcade batteries. Missile's, turret guns, tracking antennas and force fields bar your way and there's a small tunnel which must be entered low in the centre of the screen.

This is made more awkward by having a missile launching pad just before the tunnel entrance. The tunnel is a new Zaxxon feature which inhibits your altitude and makes the player fight his way past planes, flying minelayers, self-destructing robot spacecraft and indestructible mines.

The final challenge is with a larger-than-life fire-breathing dragon. Only six hits into his fiery mouth can kill the dragon which dwarfs your attack vessel.

The most useful firing you can do in Super Zaxxon is to help check your altitude and it still suffers from looking better than it plays.

The year of the mutant – that's what 1983 is turning out to be. Pinball manufacturers are plundering the video world for game themes and some strange hybrids are appearing.

Williams have gone to that all-time arcade winner, Defender, for a theme. Their latest pinball shown at the recent Amusement Trade Exhibition – has mutants, swarmers and smart bombs built in to the game. And a complicated pin it is too.

To start off with the machine has four buttons – one pair to operate the flippers, the other two with different functions.

The second button on the right-hand side of the machine operates a lane change feature. The left hand button works a "kick-back" device – similar to a feature on early Bally games – which saves a ball destined for oblivion down the out chute. You have to earn points to use it of course!

There's also a mysterious Smart Bomb feature which our reviewer, Gary Flower of the Pinball Owners Association didn't have time to fathom. It's also a multiball game which adds to the excitement. All in all a challenging and different pin.

HAVE A BALL DOWN BELOW

MR DO

The joys of tunnelling are fully explored in the surrealistic world of Mr Do.

Dig-Dug first tempted gamesters below the surface, but Mr Do takes the best from that game theme and improves on it.

Mr Do is a pixie-like creature with a magic ball who spends his time below ground being chased by some small hungry crimson dinosaurs. He runs through existing tunnels and can create new ones, only more slowly.

The dinosaurs can also dig new passage-ways but prefer to chase you through tunnels of your own making.

Large golden apples lie buried in this subterrannean world and these act like the rocks in Dig-

Dug. Tunnelling up underneath makes them rather shaky and a split second later they plummet down on top of anything following you.

When the dinosaurs get too close you can spin around and fire your magic ball at them. This bounces through the passage way and can knockout a whole herd of pursuing creatures if it hits the leading one. But they are only KO-ed briefly and your magic ball disappears for a number of seconds.

After a while the dinosaurs split up and start coming at you from different angles. When things get too close for comfort and even your magic ball can't keep them all at bay, then there is another answer.

A flashing prize in the centre of the screen can be collected by Mr Do and this has the effect of disabling the dinosaurs. But instead a whole host of new blue monsters with gnashing teeth appear at the top of the screen and come after you.

These can also be KO-ed by the magic ball and will also tire in their chase and eventually give up to be replaced by the dinosaurs again.

The mazes are dotted with tempting red cherries which Mr Do must eat. Once all these have been cleared he is free to go onto the next screen full of yet more cherries, apples and dinosaurs but with a different maze.

AN ISLE SO NEAR . . .

SWIMMER

Come on in, the water's . . . er- . . . interesting. Swimmer may look just like a plunge into the river in search of an idyllic isle but there's a lot lurking beneath the blue waters.

Treasure island is what your Swimmer should be aiming for with the aid of an eight-way joystick and a dive button but there's a few problems going against the current.

There's the driftwood for example. And watch out for those curious turtles, they bite! You can gather the floating fruit for bonus points but keep a watch out for a monstrous crab, which is waiting for you at the end of the third screen.

Small guerrilla crabs also close in, fast and hungry and it's time to hit the dive button, hold your breath and swim under your adversaries.

If you aim for a golden ring, floating amongst the enemies, it can turn your swimmer into a superman, invulnerable to your enemies, but only for so long.

Back to mere mortal and there are sly water spiders and vicious piranhas in the river.

The aim is to defeat the host of predators and find the sanctuary of treasure island.

THE RECORDS TUMBLE

The competition on high scores is really hotting up with some records changing hands almost daily.

Tim Haywood's Pacman score has been the main victim of the host of new record scorers. It has now been doubled.

Tony Eaton found his way into the local paper with a 1,674,500 score. He munched his way through 138 screens and it took him two and a half hours. That beat most of the claimants for the Pacman record.

But he was recently bettered by David Ross, a veteran of our 1982 Best Arcade Game Player title. David rules the roost on the Isle of Wight with a score of 2,934,470.

A humble editor offers 17,410 on Pengo which was scored at the Amusements Trade Exhibition. It probably won't last for long.

Other games which provided a torrent of response were: Amidar (it'll be some time before anyone beats our current champion) Pheonix and Scramble.

We're still keen to receive some scores for Tron, Space Dungeon and Tutankham.

SCRAMBLE 2,332,230 James Thomas	FROGGER 116,150 Richard George	PACMAN 2,934,470 David Ross
TEMPEST 1,080,260 Paul Mitchell	DIG-DUG 999,990 Tooba Zaidi	AMIDAR 782,010 Adrian Eyre
GORF 972,830 Gary Miller	DONKEY KONG 428,300 John Bull	ROBOTRON 537,450 David Ross
GALAGA 1,223,290 Carl Warrington	QIX 263,820 Sarabjit Singh	PENGO 17,410 Terry Pratt
FAST FREDDIE 1,279,110 John Greggor	CRUSH ROLLER 471,530 Alan Dowler	PHEONIX 488,330 Martyn Monagham

BY JAMES DAVIES

DEFUSE

RUNS ON A TEXAS TI99/4

A chain of nuclear reactors is ready to explode — and only you can stop them!

Your job is to defuse this potentially explosive situation by entering each reactor and shutting it down.

The reactors appear at random, and you must steer your nuclear expert through them. This defuses the reactors — but gives your little man a radioactive trail which he must not cross.

There's another snag too — the reactors must be defused in the right order — otherwise it's apocalypse time!

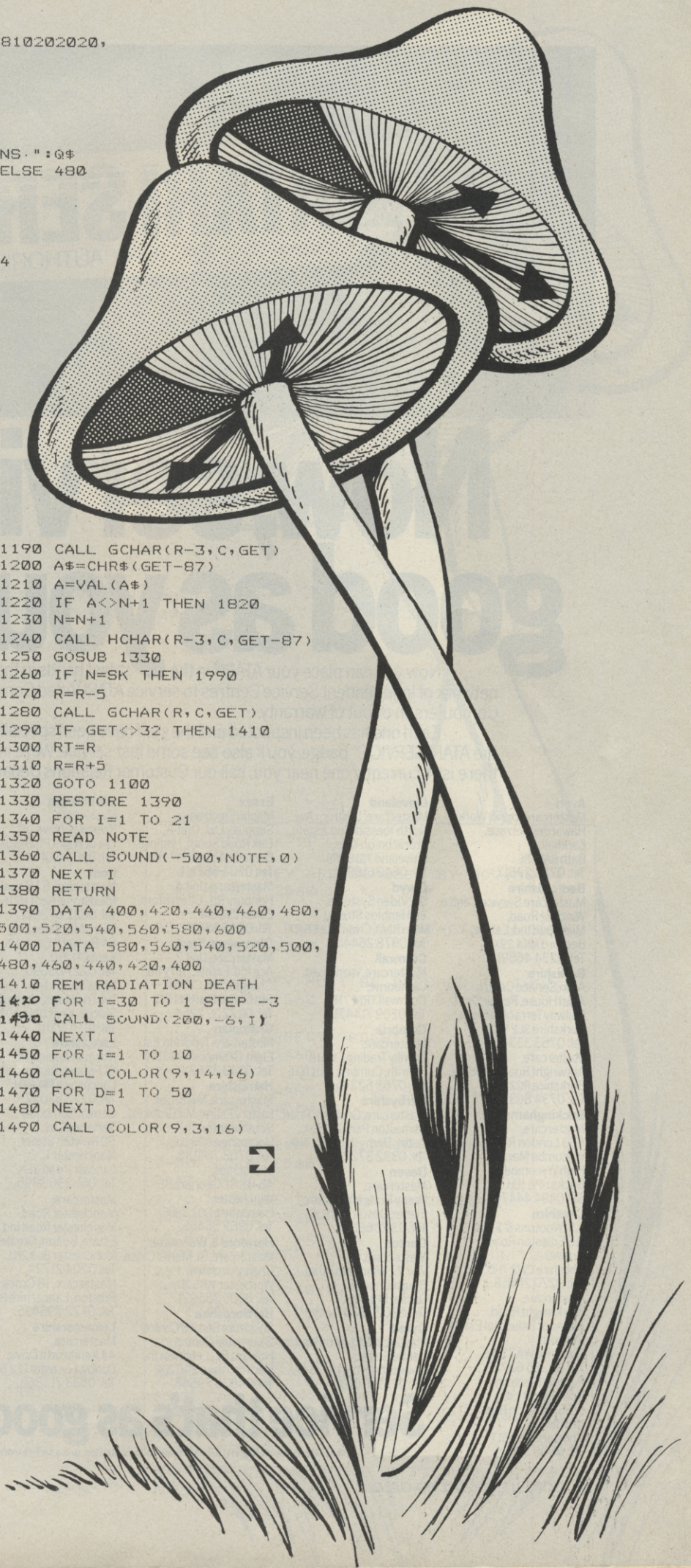
The game features full colour graphics, sound effects and full instructions. It will run on a Texas TI99/4 or 4a no peripherals are needed.

OR 4a IN 16K

```
100 REM DEFUSE
110 REM BY J. DAVIES
120 REM
130 REM SET CHARACTERS
140 CALL CLEAR
150 CALL CHAR(104,"0000000007071F1F")
160 CALL CHAR(105,"0000243CFFFFFFFF")
170 CALL CHAR(106,"00000000E0E0F8F8")
180 CALL CHAR(107,"1F1F070707073F3F")
190 CALL CHAR(108,"F8F8E0E0E0E0FCFC")
200 CALL CHAR(109,"3F3F7F7F7F232313")
210 CALL CHAR(110,"FFFFFFFFFF3C1800")
220 CALL CHAR(111,"FCFCFEFEFEC4C4C8")
230 CALL CHAR(112,"130B0B0707030FFF")
240 CALL CHAR(113,"")
250 CALL CHAR(114,"C8D0D0E0E0C0F0FF")
260 CALL CHAR(96,"18183C5A99182442")
270 CALL CHAR(97,"187E7E1818187EFF")
280 CALL COLOR(10,5,16)
290 CALL COLOR(9,14,16)
300 CALL COLOR(12,15,15)
310 CALL COLOR(11,12,16)
320 RESTORE
330 FOR I=136 TO 144
340 READ A$
350 CALL CHAR(I,A$)
360 NEXT I
370 DATA 0010301010101038,
0038440408102070,0038440418044438,
0008182848700808,007C407804044438
```

Illustrations: Terry Rogers

```
380 DATA 0018204078444438,007C040810202020,
0038444438444438,0038444443C040830
390 DEF RAN(X)=INT(X*RND)+1
400 RANDOMIZE
410 FCOLOUR=16
420 CALL COLOR(16,9,9)
430 INPUT "DO YOU WANT INSTRUCTIONS·":Q$
440 IF SEG$(Q$,1,1)="Y" THEN 450 ELSE 480
450 CALL CLEAR
460 GOSUB 2110
470 GOTO 500
480 IF SEG$(Q$,1,1)<>"N" THEN 430
490 REM SKILL LEVEL=No. REACTORS-4
500 CALL CLEAR
510 INPUT "GIVE YOUR SKILL LEVEL
(1 TO 5) ":SKILL
515 SK=SKILL+4
520 IF (SK>9)+(SK<5)THEN 510
530 FOR I=2 TO 8
540 CALL COLOR(I,2,1)
550 NEXT I
560 REM BORDER
570 CALL CLEAR
580 CALL SCREEN(16)
590 CALL HCHAR(1,1,152,32)
600 CALL HCHAR(24,1,152,32)
610 CALL VCHAR(1,1,152,24)
620 CALL VCHAR(1,32,152,24)
630 REM DISPLAY REACTORS
640 CALL COLOR(3,16,5)
650 CALL COLOR(4,16,5)
660 CALL COLOR(15,16,9)
670 CALL COLOR(14,16,9)
680 FOR REA=1 TO SK
690 R=RAN(22)
700 C=RAN(32)
710 REM CHECK AREA IS CLEAR
720 FOR RSCAN=R-1 TO R+5
730 FOR CSCAN=C-1 TO C+4
740 CALL GCHAR(RSCAN,CSCAN,GET)
750 IF GET<>32 THEN 690
760 NEXT CSCAN
770 NEXT RSCAN
800 CALL HCHAR(R,C,104)
810 CALL HCHAR(R,C+1,105)
820 CALL HCHAR(R,C+2,106)
830 CALL HCHAR(R+1,C,107)
840 CALL HCHAR(R+1,C+2,108)
850 CALL HCHAR(R+2,C,109)
860 CALL HCHAR(R+2,C+1,110)
870 CALL HCHAR(R+2,C+2,111)
880 CALL HCHAR(R+3,C,112)
890 CALL HCHAR(R+3,C+1,113)
900 CALL HCHAR(R+3,C+2,114)
910 CALL HCHAR(R+1,C+1,135+REA)
920 CALL SOUND(200,800,0)
930 CALL SOUND(100,750,0)
940 NEXT REA
950 REM
960 REM THE GAME.......
970 R=RAN(22)+1
980 C=RAN(30)+1
990 CALL GCHAR(R,C,GET)
1000 IF GET<>32 THEN 970
1010 CALL HCHAR(R,C,96)
1020 REM GET KEY AND MOVE
1030 CALL KEY(3,K,S)
1040 RT=R+(K=69)-(K=88)
1050 CT=C+(K=83)-(K=68)
1060 CALL GCHAR(RT,CT,GET)
1070 IF GET=113 THEN 1180
1080 IF GET=120 THEN 1410
1090 IF GET<>32 THEN 1140
1100 CALL HCHAR(R,C,120)
1140 FCOLOUR=25-FCOLOUR
1150 CALL COLOR(14,FCOLOUR,9)
1160 CALL COLOR(15,FCOLOUR,9)
1170 GOTO 1030
1180 REM DEFUSE
1190 CALL GCHAR(R-3,C,GET)
1200 A$=CHR$(GET-87)
1210 A=VAL(A$)
1220 IF A<>N+1 THEN 1820
1230 N=N+1
1240 CALL HCHAR(R-3,C,GET-87)
1250 GOSUB 1330
1260 IF N=SK THEN 1990
1270 R=R-5
1280 CALL GCHAR(R,C,GET)
1290 IF GET<>32 THEN 1410
1300 RT=R
1310 R=R+5
1320 GOTO 1100
1330 RESTORE 1390
1340 FOR I=1 TO 21
1350 READ NOTE
1360 CALL SOUND(-500,NOTE,0)
1370 NEXT I
1380 RETURN
1390 DATA 400,420,440,460,480,
500,520,540,560,580,600
1400 DATA 580,560,540,520,500,
480,460,440,420,400
1410 REM RADIATION DEATH
1420 FOR I=30 TO 1 STEP -3
1430 CALL SOUND(200,-6,I)
1440 NEXT I
1450 FOR I=1 TO 10
1460 CALL COLOR(9,14,16)
1470 FOR D=1 TO 50
1480 NEXT D
1490 CALL COLOR(9,3,16)
```



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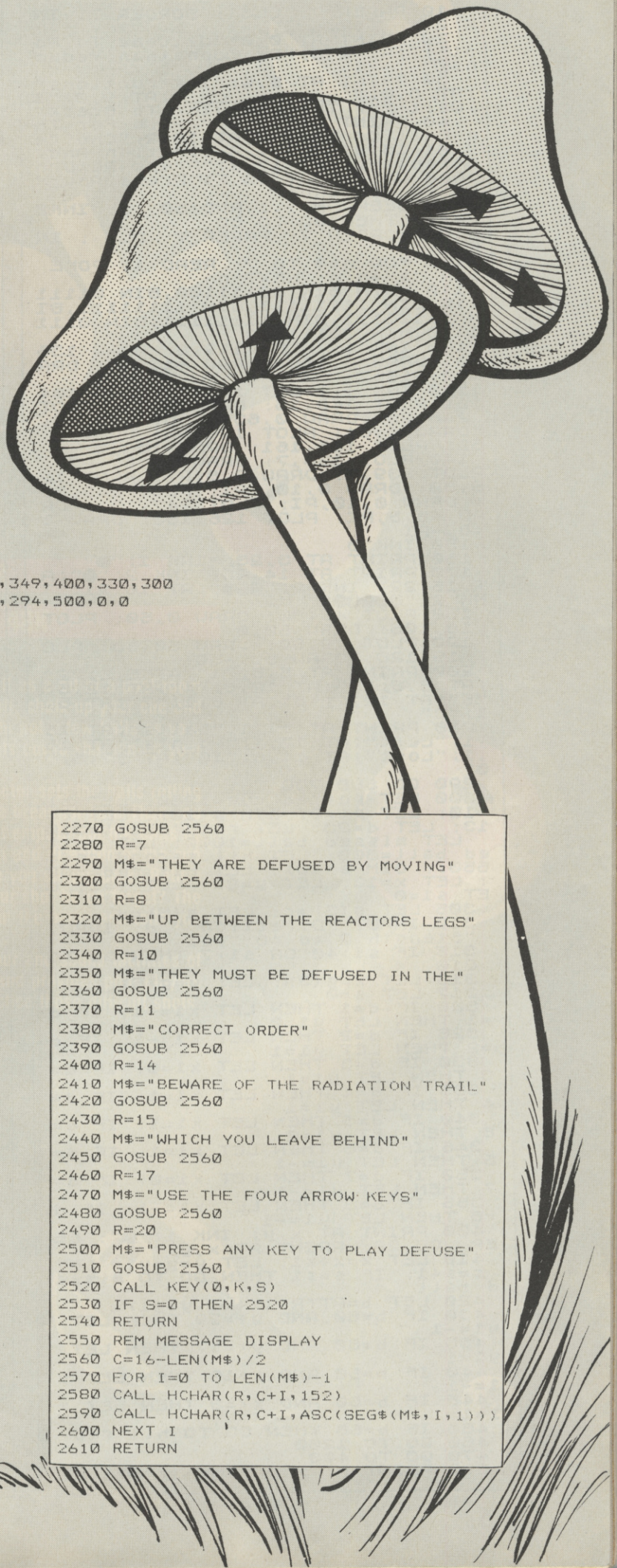
```
1500 FOR D=1 TO 50
1510 NEXT D
1520 NEXT I
1530 CALL COLOR(9,2,16)
1540 CALL HCHAR(R,C,97)
1550 CALL GCHAR(R+1,C,GET)
1560 IF GET<>105 THEN 1580
1570 CALL HCHAR(R+5,C,120)
1580 GOSUB 1730
1590 CALL CLEAR
1600 CALL COLOR(3,2,1)
1610 CALL COLOR(4,2,1)
1620 PRINT " YOU RAN OVER YOUR TRAIL"
1630 PRINT "       YOU HAVE DIED"
1640 PRINT :::
1650 PRINT "WOULD YOU LIKE TO TRY AGAIN"
1660 PRINT "(YES OR NO)";
1670 N=0
1680 INPUT Q$
1690 IF SEG$(Q$,1,1)="Y" THEN 430
1700 IF SEG$(Q$,1,1)="N" THEN 1720
1710 GOTO 1680
1720 STOP
1730 REM FUNERAL MARCH
1740 RESTORE 1800
1750 READ NOTE,DUR
1760 IF (NOTE=0)*(DUR=0) THEN 1790
1770 CALL SOUND(DUR,NOTE,0)
1780 GOTO 1750
1790 RETURN
1800 DATA 294,400,294,300,294,240,294,300,349,400,330,300
1810 DATA 330,350,294,350,294,300,277,350,294,500,0,0
1820 REM WRONG REACTOR
1830 FOR I=1 TO 30 STEP 2
1840 CALL SOUND(-1000,-7,I)
1850 FCOLOUR=25-FCOLOUR
1860 CALL SCREEN(FCOLOUR)
1870 NEXT I
1880 CALL SCREEN(9)
1890 GOSUB 1730
1900 CALL CLEAR
1910 CALL SCREEN(16)
1920 CALL COLOR(3,2,1)
1930 CALL COLOR(4,2,1)
1940 PRINT "YOU DEFUSED THEM IN THE"
1950 PRINT "       WRONG ORDER"
1960 PRINT ::"THEY ALL BLEW UP"
1970 PRINT "YOU WERE KILLED!"
1980 GOTO 1650
1990 REM SUCCESS.....
2000 GOSUB 1330
2010 CALL CLEAR
2020 PRINT "       CONGRATULATIONS"
2030 CALL COLOR(3,2,1)
2040 CALL COLOR(4,2,1)
2050 N=0
2060 PRINT ::::
2070 PRINT "WELL DONE...YOU JUST SAVED"
:"THE NATION"
2080 PRINT :::
2090 GOTO 1640
2100 REM INSTRUCTIONS
2110 FOR I=2 TO 8
2120 CALL COLOR(I,16,5)
2130 NEXT I
2140 CALL SCREEN(5)
2150 CALL CLEAR
2160 R=1
2170 M$="DEFUSE"
2180 GOSUB 2560
2190 R=2
2200 M$="********"
2210 GOSUB 2560
2220 R=4
2230 M$="DEFUSE THE NUCLEAR REACTORS"
2240 GOSUB 2560
2250 R=5
2260 M$="EACH ONE IS ABOUT TO EXPLODE"
2270 GOSUB 2560
2280 R=7
2290 M$="THEY ARE DEFUSED BY MOVING"
2300 GOSUB 2560
2310 R=8
2320 M$="UP BETWEEN THE REACTORS LEGS"
2330 GOSUB 2560
2340 R=10
2350 M$="THEY MUST BE DEFUSED IN THE"
2360 GOSUB 2560
2370 R=11
2380 M$="CORRECT ORDER"
2390 GOSUB 2560
2400 R=14
2410 M$="BEWARE OF THE RADIATION TRAIL"
2420 GOSUB 2560
2430 R=15
2440 M$="WHICH YOU LEAVE BEHIND"
2450 GOSUB 2560
2460 R=17
2470 M$="USE THE FOUR ARROW KEYS"
2480 GOSUB 2560
2490 R=20
2500 M$="PRESS ANY KEY TO PLAY DEFUSE"
2510 GOSUB 2560
2520 CALL KEY(0,K,S)
2530 IF S=0 THEN 2520
2540 RETURN
2550 REM MESSAGE DISPLAY
2560 C=16-LEN(M$)/2
2570 FOR I=0 TO LEN(M$)-1
2580 CALL HCHAR(R,C+I,152)
2590 CALL HCHAR(R,C+I,ASC(SEG$(M$,I,1)))
2600 NEXT I
2610 RETURN
```



```
  10 PAPER 7: CLS : BORDER 7: IN
K 0
  20 PRINT AT 0,0;"Welcome To Po
ol!!";AT 2,6;"By ©Jonathan Yeoma
ns©"
  30 PRINT AT 5,0;"Instructions"
;AT 6,0;"____________";AT 9,0;"1
)Wait For The Computer To Break"
  40 PRINT AT 11,0;"2)Aim For Th
e Ball Of Your ";AT 13,2;"Choice
";AT 15,2;"Input A Direction And
 Strength.";AT 17,2;"Press Return
 And Watch";AT 20,5;"Press Any K
ey To continue"
  50 BEEP RND*.1,RND*50: IF INKE
Y$="" THEN GO TO 50
  90 BORDER 7: PAPER 7: CLS : IN
K 0
 100 FOR n=0 TO 7: READ a: POKE
USR "a"+n,a: NEXT n
 110 DATA BIN 00111100,BIN 01111
110,BIN 11111111,BIN 11111111,BI
N 11111111,BIN 11111111,BIN 0111
1110,BIN 00111100
 120 INK 4: PLOT 119,0: DRAW 135
,0: DRAW 0,166: DRAW -136,0: DRA
W 0,-166
 130 INK 4: PLOT 135,7: DRAW 104
,0: PLOT 248,15: DRAW 0,64: PLOT
 248,90: DRAW 0,63: PLOT 126,15:
 DRAW 0,64: PLOT 126,90: DRAW 0,
62: PLOT 136,151: DRAW 103,0
 140 PLOT 134,7: DRAW -6,6,-PI:
PLOT 239,7: DRAW 9,6,PI: PLOT 12
5,80: DRAW 0,10,-PI: PLOT 249,80
: DRAW 0,10,PI: PLOT 247,153: DR
AW -8,8,PI: PLOT 126,153: DRAW 8
,8,-PI
 150 INK 0
 160 PRINT AT 3,23; INK 1;"●"
 170 PRINT AT 14,23; INK 2;"●";A
T 15,22; INK 2;"●●●";AT 16,21; I
NK 2;"●●●●●"
 180 PLOT 43,80: DRAW 0,50: PLOT
 18,105: DRAW 50,0
 190 PLOT 19,80: DRAW 50,50: PLO
T 19,128: DRAW 50,-50
 200 PRINT AT 5,5;"1";AT 5,8;"2"
;AT 8,8;"3";AT 12,8;"4";AT 12,5;
"5";AT 12,1;"6";AT 8,1;"7";AT 5,
1;"8"
 210 PRINT AT 14,1;"Balls";AT 15
,1;"Left";AT 17,1;"Points";AT 18
,1;"Lost";AT 14,8;"10";AT 17,8;"
0"
 290 GO SUB 700
 300 LET potted cue=1250: LET b1
=10: LET p1=0: DIM g(10): LET c=
13: LET d=23: LET returnball=310
: LET missed ball=1000: LET pott
ed ball=800: LET hit second red=
650:: DIM a(10): LET hit red=500
: LET x=13: LET y=23: LET s=1: L
ET s1=0
 305 LET g(3)=c: LET g(5)=d
 310 INPUT "Direction ";d: INPUT
 "Stength 7 to 40 ";s1
 315 IF s1>40 OR s1<7 THEN GO TO
 310
 316 LET x=g(3): LET y=g(5)
 317 LET s=0
 320 IF d=1 THEN LET x1=-1: IF d
=1 THEN LET y1=0
 325 IF d=2 THEN LET x1=-1: IF d
=2 THEN LET y1=1
 330 IF d=3 THEN LET x1=0: IF d=
3 THEN LET y1=1
 335 IF d=4 THEN LET x1=1: IF d=
4 THEN LET y1=1
 340 IF d=5 THEN LET x1=1: IF d=
5 THEN LET y1=0
 345 IF d=6 THEN LET x1=1: IF d=
6 THEN LET y1=-1
 350 IF d=7 THEN LET x1=0: IF d=
7 THEN LET y1=-1
 355 IF d=8 THEN LET x1=-1: IF d
=8 THEN LET y1=-1
 400 PRINT AT x,y; INK 1;"●": BE
EP .05,20: PRINT AT x,y;" ";
 410 LET x=x+x1: LET y=y+y1: LET
 s=s+1: IF s=s1 THEN GO TO missa
d ball
 420 LET b=ATTR (x+x1,y+y1)
 430 IF b=60 AND y>=29 THEN LET
y1=-1
 435 IF b=60 AND y<=17 THEN LET
y1=1
 440 IF b=60 AND x>19 THEN LET x
1=-1
 445 IF b=60 AND x<=3 THEN LET x
1=1
 450 IF b=56 THEN GO TO hit red
 460 GO TO 1200
 470 GO TO 400
 500 PRINT AT x,y; INK 1;"●": LE
T g(3)=x:: LET g(5)=y
 510 LET x2=x+x1: LET x=x2: LET
y2=y+y1: LET y=y2
 530 LET s2=s1: LET s=0
 540 PRINT AT x,y; INK 2;"●": BE
EP .09,30: PRINT AT x,y;" "
 545 PRINT AT g(3),g(5); INK 1;"
●"
 555 INK 0
 560 LET b=ATTR (x+x1,y+y1): LET
 b1=ATTR (x,y)
 570 IF b=56 THEN GO TO hit seco
nd red
 590 IF b=60 AND y<17 THEN LET y
1=1
 591 IF b=60 AND y>29 THEN LET y
1=-1
 594 IF b=60 AND x<3 THEN LET x1
=1
 595 IF b=60 AND x>19 THEN LET x
1=-1
 600 IF x=20 AND y=16 THEN GO TO
 potted ball
 602 IF x=20 AND y=30 THEN GO TO
 potted ball
 604 IF x=11 AND y=16 THEN GO TO
 potted ball
 606 IF x=11 AND y=30 THEN GO TO
 potted ball
 608 IF x=2 AND y=16 THEN GO TO
potted ball
 610 IF x=2 AND y=30 THEN GO TO
potted ball
 615 LET s=s+1
 620 LET x=x+x1: LET y=y+y1: IF
s=s2 THEN PRINT AT x,y; INK 2;"●
": IF s=s2 THEN GO TO returnball
 630 GO TO 540
 640 GO TO 550
 650 PRINT AT x,y; INK 2;"●"
 660 GO TO 620
 700 FOR n=3 TO 13: PRINT AT n,2
3; INK 1;"●": BEEP .1,n: PRINT A
T n,23;" ": NEXT n: PRINT AT 13,
23; INK 1;"●"
 710 PRINT AT 14,23; INK 0;" ";A
T 15,22; INK 0;"   ";AT 16,21; I
NK 0;"  "
 715 LET a1=0: LET b1=0
 720 FOR n=1 TO 10
 730 LET a1=INT (RND*11)+16: LET
 b1=INT (RND*16)+3: IF ATTR (b1,
a1)<>56 THEN GO TO 730
 735 BEEP .1,n
 740 PRINT AT b1,a1; INK 2;"●":
NEXT n
 760 RETURN
 800 RESTORE 800: FOR n=1 TO 17:
 READ a5,b5: BEEP a5,b5: NEXT n
 810 DATA .1,9,.1,5,.1,5,.2,5,.2
,5,.1,9,.1,5,.2,7,.1,7,.1,12,.1,
12,.1,12,.2,9,.9,12,.3,7,.1,7,.3
,7
 820 LET bl=bl-1: PRINT AT 14,8;
bl;" "
 830 GO TO 310
 992 IF b=60 AND x>19 THEN LET x
1=-1
1000 PRINT AT 1,1; PAPER 1; INK
6; FLASH 1;"Missed": FOR n=0 TO
50: BEEP .1,n: NEXT n: PRINT AT
1,1;"
1010 LET g(5)=RND*11+16: LET g(3
)=(RND*16)+3: PRINT AT g(3),g(5)
; INK 1;"●": LET p1=p1+2
1020 PRINT AT 17,8;p1
1030 GO TO 310
1200 IF x=20 AND y=16 THEN GO TO
 potted cue
1205 IF x=20 AND y=30 THEN GO TO
 potted cue
1210 IF x=11 AND y=16 THEN GO TO
 potted cue
1215 IF x=11 AND y=30 THEN GO TO
 potted cue
1220 IF x=2 AND y=30 THEN GO TO
potted cue
1225 IF x=2 AND y=16 THEN GO TO
potted cue
1230 GO TO 470
1260 PRINT AT 1,1; PAPER 5; INK
0;"Potted Cue";AT 3,3; PAPER 5;
INK 0;"Ball"
1270 RESTORE 1275: FOR n=0 TO 35
: READ a,b: BEEP a/4,b+12: NEXT
n
1275 DATA 1,0,1,2,.5,3,.5,2,1,0,
1,0,1,2,.5,3,.5,2,1,0,1,3,1,5,2,
7,1,3,1,5,2,7,.75,7,.25,8,.5,7,.
5,5,.5,3,.5,2,1,0,.75,7,.25,8,.0
,7,.5,5,.5,3,.5,2,1,0,1,0,1,-5,2
,0,1,0,1,-5,2,0
1276 PRINT AT 1,1;"          ";A
T 3,3;"  "
1280 GO TO 1010
```

Illustration: Dorian Cross

POOL

BY JOHNATHAN YEOMANS

RUNS ON A SPECTRUM IN 48K

Fancy yourself as a bit of a pool-room hustler? Well, chalk-up your cue and get ready to pot a few balls as your Spectrum sets out to sharpen-up your skills.

The computer sets the balls rolling by playing the break for you. Then you have to attempt to pot the balls by inputting the strength and direction of the cue ball. Once this is done you simply press Return and sit back and watch. Will your shot be on target? The computer keeps score throughout the game and tells you how many balls are left.

The game puts all the colour and sound facilities of the Spectrum to good use — and provides pool players with the ideal way to practice those difficult shots.

For the best hardware, the best software.

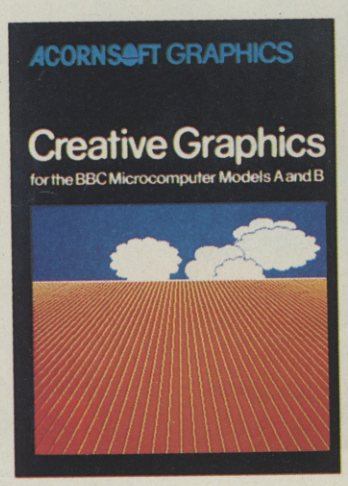
The BBC Microcomputer system is generally regarded to be the best micro in its price range you can lay your hands on. So, if you're thinking of buying one or already own one, you'll want to know about the software that's been specially designed for it.

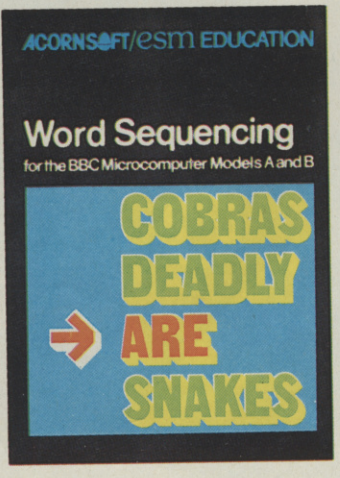
Not surprisingly, it's made by Acornsoft, the software division of Acorn Computers Ltd., who designed and built the BBC Microcomputer. So naturally you can expect the highest quality software with the built-in ingenuity to fully exploit the BBC Micro's potential.

Further education for everyone.

Creative Graphics, which includes the book 'Creative Graphics on the BBC Microcomputer' (price £17.45), provides 36 programs on cassette producing a spectacular range of pictures and patterns in full colour, including animated pictures, recursively-defined curves and three dimensional shapes.

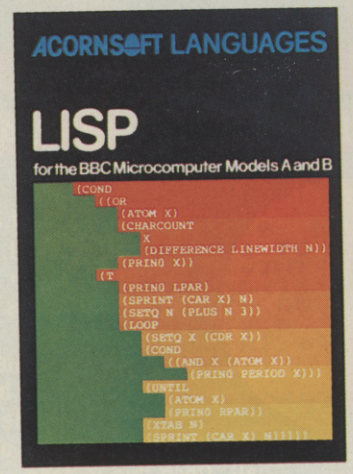
Word Sequencing (price £11.90) contains three word sequencing programs on cassette. Each program presents a series of jumbled words which must be arranged on screen to form either a proverb, nursery rhyme title or a sensible sentence.

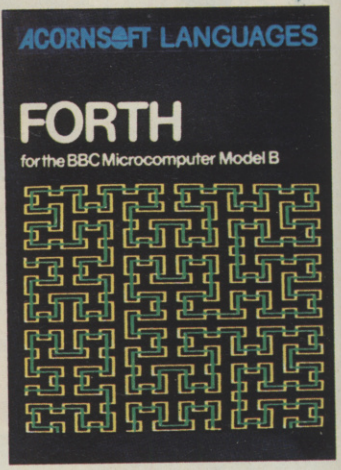




Learn more languages.

LISP (price £24.35) is the fundamental language of artificial intelligence research.



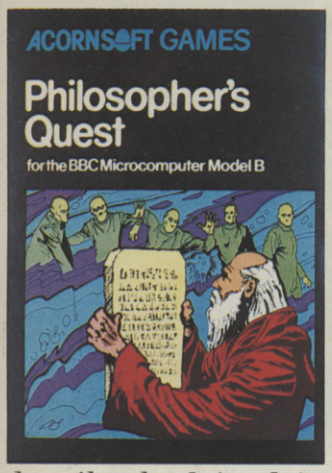


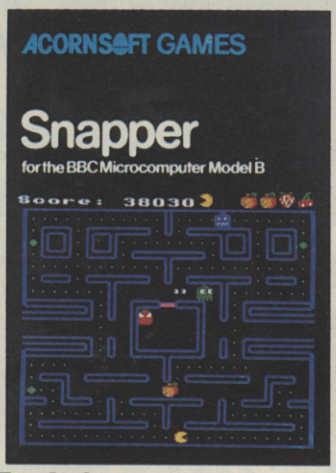
It consists of 5.5K of machine code interpreter, plus 3K of initialised LISP work-space containing utilities and constants. It comes complete with a book that introduces you to programming in LISP, as well as some fascinating applications.

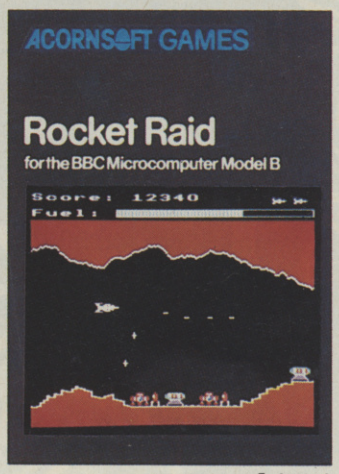
FORTH (price £24.35) is a complete implementation of the FORTH language to the 1979 standard specification for the BBC Microcomputer Model B. This much acclaimed programming language is also accompanied by a specially written book explaining all you need to know.

Mind-boggling games.

Philosopher's Quest (price £9.95) is an advanced adventure in which you tell the computer what you want to do and it







describes back in plain English your progress through a fascinating world of fiendish puzzles to be solved.

Snapper (price £9.95) is a colourful game where you guide your 'snapper' through the maze, eating dots and fruit and avoiding the creatures that chase you. Complete with full sound effects, score and a ladder of high scores.

Rocket Raid (price £9.95) sends you on a mission to raid a heavily guarded Martian fuel depot. You must fly your rocket over mountains and through caverns, avoiding enemy missiles and dodging convoys of deadly fizzers.

Increase your business acumen.

Desk Diary (price £9.95) is an indispensable program that can hold a file of several hundred names, addresses and telephone numbers.

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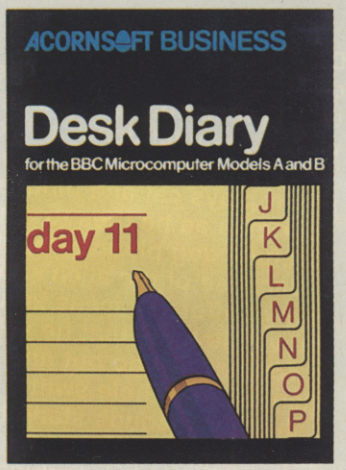

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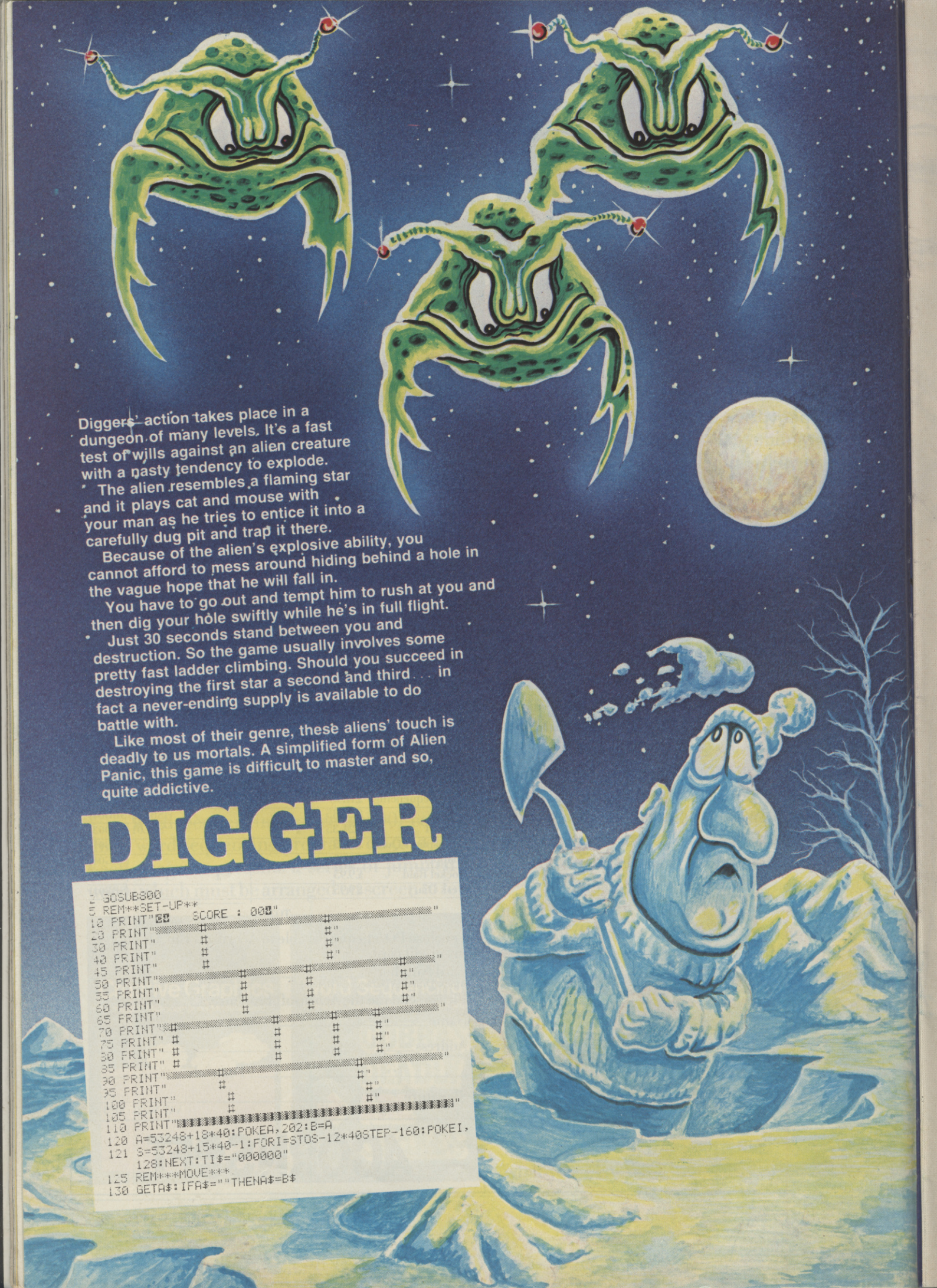


Diggers' action takes place in a dungeon of many levels. It's a fast test of wills against an alien creature with a nasty tendency to explode.

The alien resembles a flaming star and it plays cat and mouse with your man as he tries to entice it into a carefully dug pit and trap it there.

Because of the alien's explosive ability, you cannot afford to mess around hiding behind a hole in the vague hope that he will fall in.

You have to go out and tempt him to rush at you and then dig your hole swiftly while he's in full flight.

Just 30 seconds stand between you and destruction. So the game usually involves some pretty fast ladder climbing. Should you succeed in destroying the first star a second and third . . . in fact a never-ending supply is available to do battle with.

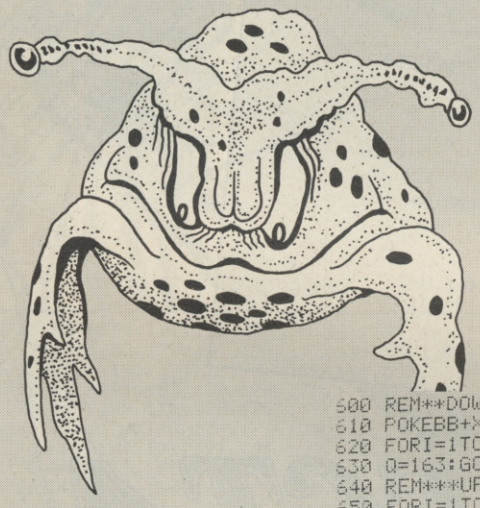
Like most of their genre, these aliens' touch is deadly to us mortals. A simplified form of Alien Panic, this game is difficult to master and so, quite addictive.

DIGGER

```
5 GOSUB800
5 REM**SET-UP**
10 PRINT"■■    SCORE : 00■"
20 PRINT"
30 PRINT"
40 PRINT"
45 PRINT"
50 PRINT"
55 PRINT"
60 PRINT"
65 PRINT"
70 PRINT"
75 PRINT"
80 PRINT"
85 PRINT"
90 PRINT"
95 PRINT"
100 PRINT"
105 PRINT"
110 PRINT"
120 A=53248+18*40:POKEA,202:B=A
121 S=53248+15*40-1:FORI=STOS-12*40STEP-160:POKEI,
    128:NEXT:TI$="000000"
125 REM***MOVE***
130 GETA$:IFA$=""THENA$=B$
```

RUNS ON A SHARP MZ30K IN 32K

BY NICK ALEXANDER



```
135 Z=Z+1:IFZ=2THENZ=0:GOTO500
140 POKEB+X,C:X=X+((A$="K")*(X<37))-((A$="J")*(X>0)):C=PEEK(B+X)
141 IFPEEK(B+X+40)=0THEN1000
142 IFA$="F"THEN400
143 IFA$="D"THEN300
144 IFA$=" "THEN200
145 POKEB+X,202
146 IFC=107THEN1000
150 B$=A$
160 IFB$="K"THENN=1
165 IFB$="J"THENN=2
166 PRINT"■■";TAB(24);"TIME:";MID$(TI$,5,2)
167 IFMID$(TI$,5,2)="15"THEN1000
170 GOTO130
195 REM***CLIMB***
200 D=PEEK(B+X+40)
205 IF(D<>163)*(C<>163)THEN145
210 IFD=163THEN260
220 FORI=1TO4:POKEB+X,163:B=B-40:POKEB+X,202:MUSIC"C1DEDC":NEXTI
225 C=0:B$="":GOTO130
260 POKEB+X,0:B=B+40:POKEB+X,202:FORI=1TO3:POKEB+X,163:B=B+40:POKEB+X,202
270 MUSIC"E1DCDE":NEXTI:C=163:B$="":GOTO130
290 REM***DIG***
300 IFN=1THEN350
310 IF(PEEK(B+X+39)<>208)+(PEEK(B+X-1)=163)THEN145
315 MUSIC"▔C1GEC"
320 POKEB+X+39,0:A$="":GOTO145
350 IF(PEEK(B+X+41)<>208)+(PEEK(B+X+1)=163)THEN145
355 MUSIC"▔C1GEC"
360 POKEB+X+41,0:A$="":GOTO145
390 REM***FILL***
400 IFN=1THEN450
410 IFPEEK(B+X+39)<>0THEN145
415 MUSIC"C1EG▔C"
420 POKEB+X+39,208:A$="":GOTO145
450 IFPEEK(B+X+41)<>0THEN145
455 MUSIC"C1EG▔C"
460 POKEB+X+41,208:A$="":GOTO145
500 IFM=1THEN550
510 XX=INT(RND(1)*38):BB=53328:M=1
520 S=INT(RND(1)*4)*160:BB=BB+S
550 POKEBB+XX,0:IFX>XXTHENXX=XX+1
560 IFXX>XTHENXX=XX-1
565 Q=PEEK(BB+XX):QD=PEEK(BB+XX+40)
566 IFQD=0THENM=0:SC=SC+10:PRINT"■■
 SCORE :";SC:TI$="000000":GOTO670
567 IFQ=202THEN1000
568 IF(Q=163)*(BB>B)THEN640
569 IF(QD=163)*(BB<B)THEN600
570 POKEBB+XX,107:GOTO140
600 REM**DOWN**
610 POKEBB+XX,0:BB=BB+40:POKEBB+XX,107
620 FORI=1TO3:POKEBB+XX,163:BB=BB+40:POKEBB+XX,107:USR(62):NEXTI
630 Q=163:GOTO570
640 REM***UP***
650 FORI=1TO4:POKEBB+XX,163:BB=BB-40:POKEBB+XX,107:MUSIC"▁C1":NEXTI:Q=0
660 GOTO570
670 FORI=1TO3:MUSIC"▔C0#BB#AA#GG#FF#EE#DD#CC":NEXT:GOTO140
800 PRINT"■■■■■■▛▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▜"
802 PRINT"■■■■■■▌                 ▐"
804 PRINT"■■■■■■▌                 ▐"
805 PRINT"■■■■■■▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▟"
806 FORI=1TO1000:NEXT:TEMPO7
810 FORI=1TO6:POKE53380+(I*40),163:FORI1=1TO200:NEXT:MUSIC"C0":NEXT
815 FORI=1TO15:POKE53655+I,208:FORI1=1TO200:NEXT:MUSIC"▔C0":NEXT:POKE53628,202
817 FORI=1TO6:POKE53380+(I*40),107:MUSIC"F0":FORI1=1TO500:NEXT
818 POKE53380+(I*40),163:NEXT
819 FORI=1TO6:POKE53621+I,107:FORI1=1TO400:NEXT:MUSIC"▔F0":IFI=4THENI4=1
820 IFI4=1THENPOKE53667,0:PRINT"■■■";TAB(13);"*DIG*":I4=0
825 POKE53621+I,0:NEXT
826 FORI=1TO5
830 FORI=1TO7:MUSIC"▔C0#BB#AA#GG#FF#EE#DD#CC":NEXT:PRINT"■■■■■■■■■■SCORE10"
840 PRINTTAB(10);"■■■■▛▀▀▀▀▀▀▀▀▀▀▀▀▀▀▀▜ ":FORI=1TO600:NEXT:USR(62)
850 PRINTTAB(10);"▌THE  GAME▐ ":FORI=1TO600:NEXT:USR(62)
855 PRINTTAB(10);"▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▄▟ ":FORI=1TO600:NEXT:USR(62)
900 PRINT"The game is set in a dungeon.The object is to destroy the flaming";
905 PRINT" star before it explodes.There is a 15 second limit before the ";
910 PRINT" star explodes.To destroy the star you must dig a hole and lure";
915 PRINT" the star to fall and die.It follows you and if it actually ";
920 PRINT" touches you,instant death folows."
925 PRINT"■■■■■PRESS ANY KEY"
930 GETD$:IFD$=""THEN930
940 PRINT"■";TAB(15);"■▛▀▀▀▀▀▀▀▀▀▀▀▀▀▀▜ ":FORI=1TO600:NEXT:USR(62)
950 PRINTTAB(15);"▌ CONTROLS ▐ ":FORI=1TO600:NEXT:USR(62)
955 PRINTTAB(15);"▙▄▄▄▄▄▄▄▄▄▄▄▄▄▄▟ ":FORI=1TO600:NEXT:USR(62)
960 PRINT"■";TAB(17);"J↓";CHR$(99);"↑K"
965 PRINT"■";TAB(17);"D-DIG":USR(62):PRINT"■";TAB(17);"F-FILL":USR(62)
966 PRINT"■";TAB(17);"SPACE-UP&DOWN":USR(62)
970 PRINT"■■■■■■PRESS ANY KEY TO PLAY"
980 GETD$:IFD$=""THEN980
990 RETURN
1000 FORI=1TO1000:NEXT:TEMPO7:MUSIC"C4EG▔CGEC▁G▁E▁C"
1005 PRINT"■■■SCORE";SC:PRINT"■Do you want another gameY/N":FORI=1TO1000:NEXT
1010 GETF$:IFF$=""THEN1010
1020 IFF$="Y"THENCLR:GOTO5
```

Illustration: Dorian Cross

CONNECT 4

BY KEITH HOOK

RUNS ON A VIDEO GENIE

OR TRS-80 LEVEL II IN 16K

This is a simple game to learn and anyone who can distinguish between numbers 1 to 8 can play it! The idea is to pit your wits against the computer and try to place four of your markers in such a way that they form a line either horizontally, vertically or diagonally.

This version contains a sound routine that is poked into memory and converted to machine language.

There is no need to protect any memory when you run the game as I have used 16478 onwards which is not used by the interpreter after power up. This saves memory as this location resides within the part of memory that is normally saved by the Basic Interpreter.

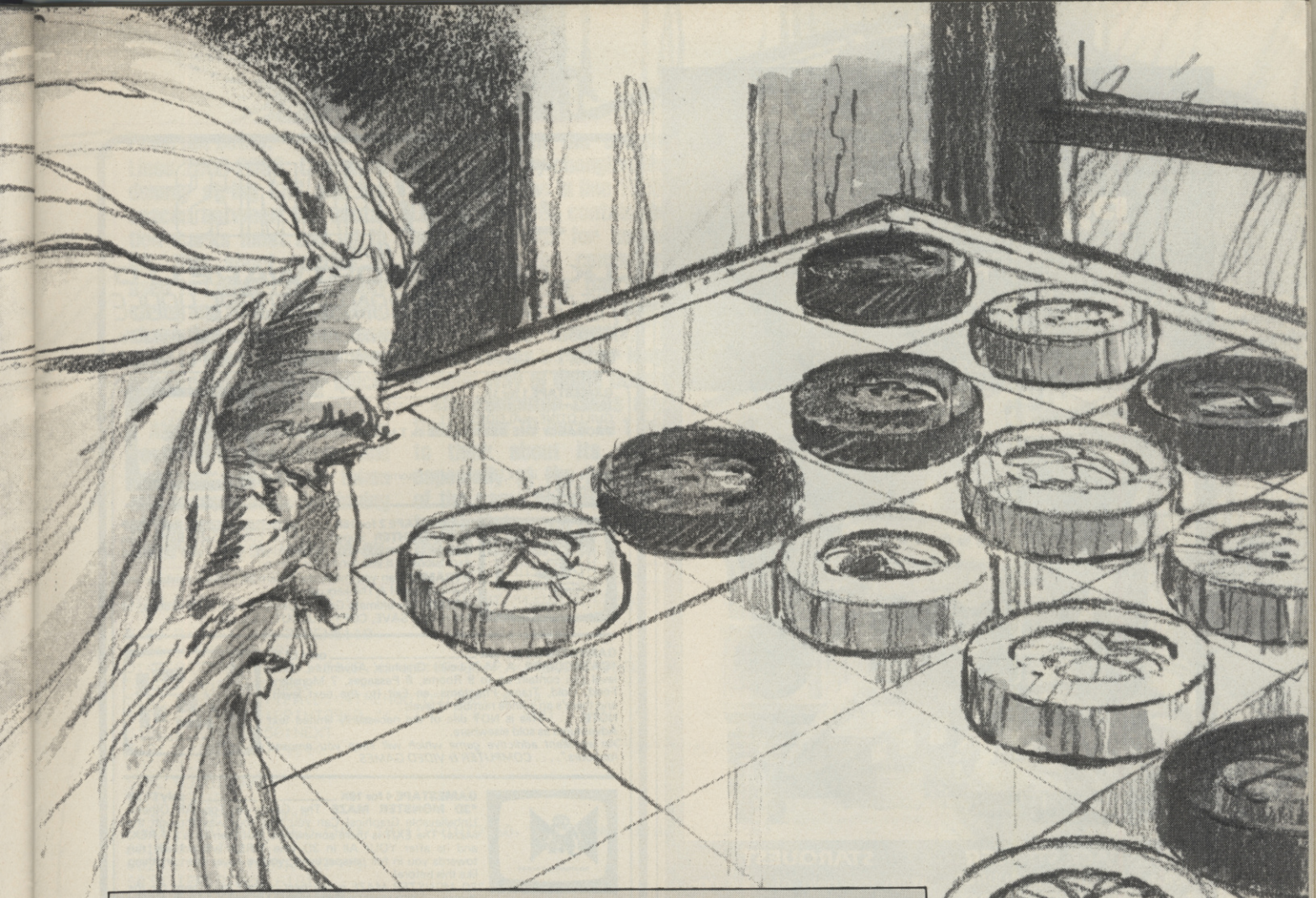
A point to note is that any short language subroutine can be poked here.

If you don't require sound delete lines 1515 through to 1519 then delete all the V=USR( ) calls.

To use this sound routine you must have the Video Genie conversion kit installed or through the external cassette socket by taking the plug which normally fits into the auxiliary socket of the recorder and reconnecting it to an external amplifier. Tandy TRS-80 users should have no problem.

```
1 CLS
10 GOTO1500
50 CLS:GOSUB2500
51 GOSUB5000
60 O$=H$: IFX$=H$THENO$=C$
65 Y=1:YY=0:S=0:GOSUB200
70 Y=1:YY=1:GOSUB200
75 Y=0:YY=1:GOSUB200
80 Y=-1:YY=1:GOSUB200
85 RETURN
200 XX=1:A=1:Q=0:S=S+1
201 M=0
210 FORI=1TO3:H=X+I*YY:N=R+I*Y
220 IFH<1 OR N<1 OR H>8 OR N>8THEN280
230 G$=G$(N,H):IFM=0THEN260
240 IFG$=O$THENI=4:GOTO280
250 Q=Q+1:GOTO280
260 IFG$=X$THENA=A+1:GOTO280
270 M=1:GOTO240
280 NEXTI
290 IFXX=0THENA(S)=A:K(S)=Q:RETURN
300 XX=0:YY=-YY:Y=-Y:GOTO201
1499 ' INITIALISE
1500 CLEAR1500:
1505 CLS:DEFINTA,B,C,D,H,I,J-T,V-Z
1510 DIMG$(8,8),A(4),R(8),K(4),J(4),G(16),GC(8,8)
1515 'FORINIT OF SOUND
1516 FORJJ=16478TO16500
1517 READLL:POKEJJ,LL:NEXTJJ
```

```
1518 DATA205,127,10,76,69,62,1,211,255,16,254,69,62,2,211,255,16,254,13,194,98,6
4,201
1519 POKE16526,94:POKE16527,64
1540 PRINT@521,"############   CONNECT  FOUR   ############"
1545 PRINT:PRINTTAB(11)"BASED ON MILTON BRADLEY'S CONNECT FOUR"
1546 FORI=1TO2000:NEXT
1550 FORI=1TO16:READG(I):NEXTI
1555 DATA2,120,505,1E22,1,880,4500,1E30,1,80,1000,1E16,2,500,3050,1E18
1560 H$=CHR$(137)+CHR$(143)+CHR$(134)
1565 C$=CHR$(143)+CHR$(143)+CHR$(143)
1570 CLS:PRINT:PRINT"DO YOU NEED INSTRUCTIONS";
1575 IN$=INKEY$
1580 IF IN$="Y"THENV=USR(9000):GOTO4000
1585 IFIN$="N"THENV=USR(32100):GOTO50
1590 GOTO1575
2499 ' PRINT BOARD
2500 GR$="                64 SPACES                "
2510 DATA32,32,32,32,32,32,32,191,128,45,45,45,128,191,128,45,45,45,128,191,128,
45,45,45,128,191,128,45,45,45,128,191,128,45,45,45,128,191,128,45,45,45,128,191,
128,45,45,45,128,191,128,45,45,45,128,191,32,32,32,32,32,32,32,32
2530 Q=VARPTR(GR$)
2540 P=PEEK(Q+2)*256+PEEK(Q+1)
2550 FORI=PTOP+63
2560 READGR
2570 POKEI,GR
2580 NEXTI
2590 FORI=192TO640STEP64
2591 PRINT@I,GR$:NEXTI
2600 FORI=16071TO16119
2610 READGR
2620 POKEI,GR:NEXT
2630 FORI=16135TO16183
2640 READGR
2650 POKEI,GR:NEXTI
2660 FORI=16199TO16205
2670 READGR
2680 POKEI,GR:NEXTI
2690 FORI=16242TO16247
2700 READGR
2710 POKEI,GR:NEXTI
2715 FORI=16263TO16311
2716 READGR
2717 POKEI,GR:NEXT
```



```
2720 DATA191,191,191,49,170,191,191,191,191,50,170,191,191,191,191,51,170,191,19
1,191,191,52,170,191,191,191,191,191,53,170,191,191,191,191,54,170,191,191,191,191,5
5,170,191,191,191,191,56,170,191,191,191
2730 DATA191,183,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179
,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179,179
,179,179,179,179,179,179,179,179,187,191,191
2740 DATA191,191,191,191,159,135,128
2750 DATA139,175,191,191,191,191
2760 DATA189,159,135,129,128,128,128,128,128,128,128,128,128,42,42,128,128,67,79
,78,78,69,67,84,128,128,128,128,70,79,85,82,128,128,42,42,128,128,128,128,128,12
8,128,128,128,130,139,175,190
2770 FORI=8TO1STEP-1:FORJ=1TO8
2771 READGC(I,J)
2772 NEXTJ:NEXTI
2775 DATA201,207,213,219,225,231,237,243,265,271,277,283,289,295,301,307,329,335
,341,347,353,359,365,371,393,399,405,411,417,423,429,435,457,463,469,475,481,487
,493,499,521,527,533,539,545,551,557,563,585,591,597,603,609,615,621,627,649,655,
 661,667,673,679,685
2780 DATA691
2781 FORI=15378TO15405
2783 READJI:POKEI,JI:NEXTI
2785 DATA35,32,67,79,77,80,85,84,69,82,32,65,78,68,32,86,73,68,69
2787 DATA79,32,71,65,77,69,83,32,35
2789 RETURN
4000 CLS:PRINTTAB(19)"CONNECT  FOUR"
4010 PRINT:PRINT"THE GAME CONSISTS OF PLACING
";H$;" ON THE BOARD WITH THE"
4020 PRINT"INTENTION OF TRYING TO GET FOUR OF YOUR MARKERS IN A ROW"
4030 PRINT"      VERTICALLY,HORIZONTALLY, OR DIAGONALLY."
4040 PRINT:PRINT"THE COMPUTER WILL PLAY ";C$;" AND WILL TRY TO OUT-WIT";
4050 PRINT" YOU !!!"
4060 PRINT"THE COMPUTER PLAYS A GOOD GAME .... SO... WATCH OUT."
4070 PRINT:PRINT"NOW PRESS ANY KEY TO CONTINUE..."
4080 IF INKEY$=""THEN4080ELSE50
4999 'HUMAN MOVE
5000 PRINT@960,"DO YOU WANT TO GO FIRST ?";
5010 IN$=INKEY$
5020 IFIN$="N" THENV=USR(8090):GOTO6000
5030 IFIN$=""THEN5010
5031 V=USR(31999)
5040 PRINT@960,CHR$(30);
5050 POKE16537,0
5060 PRINT@960,"PICK A NUMBER BETWEEN 1 & 8";
5070 IN$=INKEY$
5071 IFIN$=""THEN5070
5080 X=VAL(IN$)
5090 X=INT(X)
5100 IFX>=1 AND X<=8 GOTO5130
5110 PRINT@960,CHR$(30);
```

Illustration: Jon Davis

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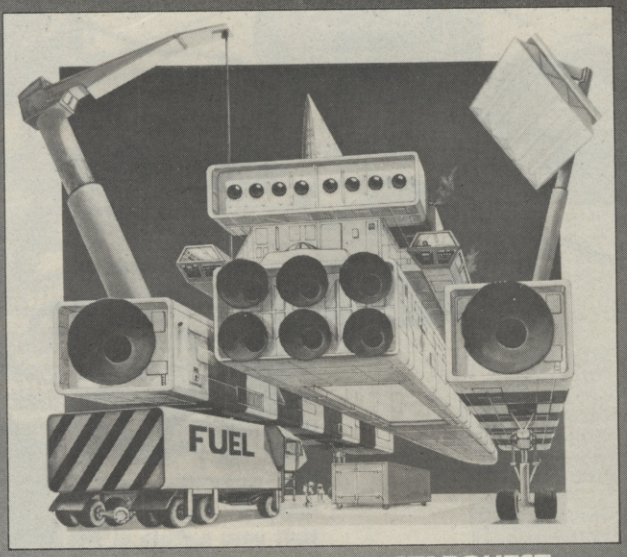

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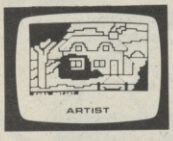

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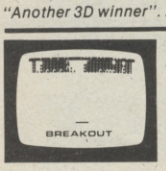

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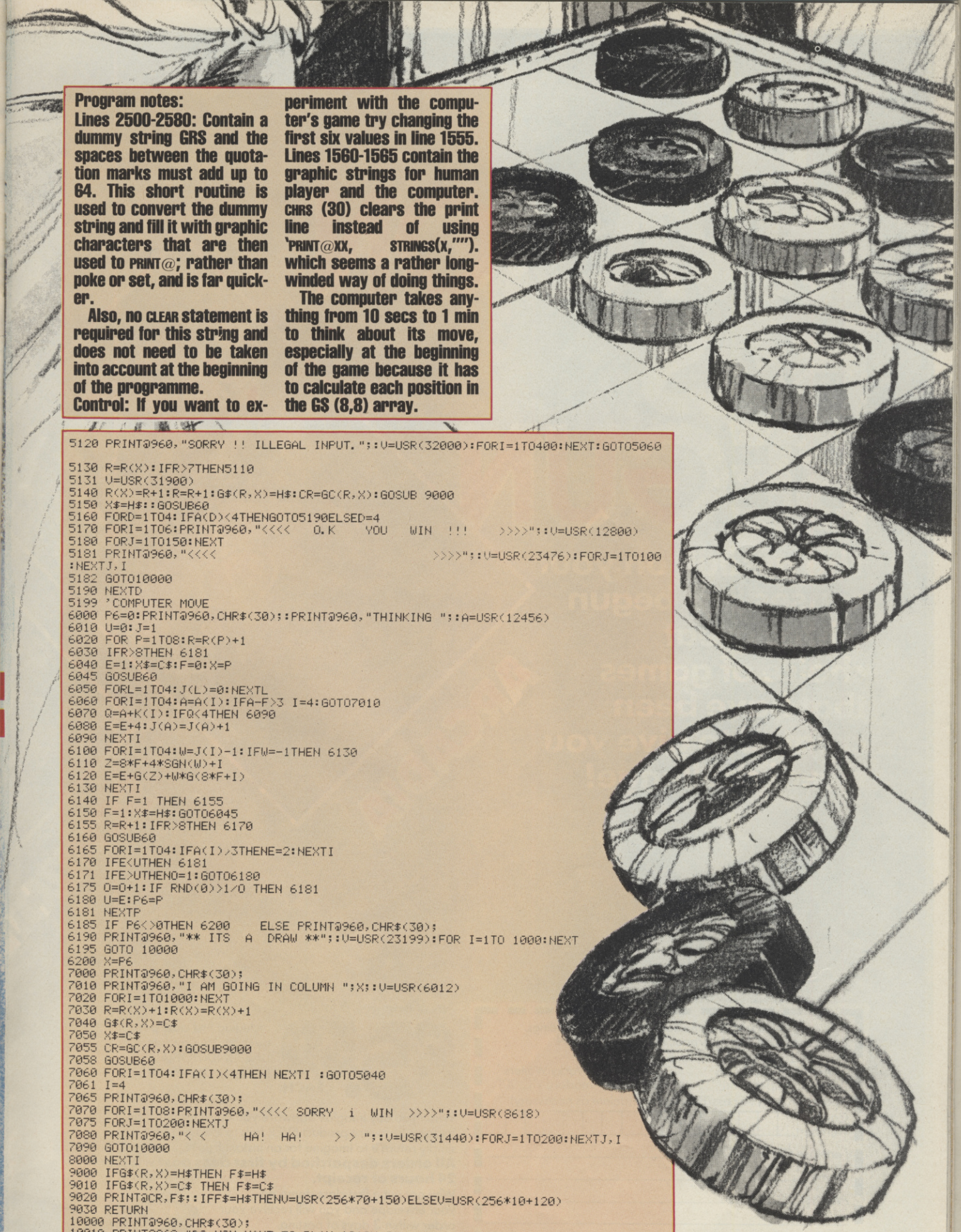

Program notes:
Lines 2500-2580: Contain a dummy string GRS and the spaces between the quotation marks must add up to 64. This short routine is used to convert the dummy string and fill it with graphic characters that are then used to PRINT@; rather than poke or set, and is far quicker.

Also, no CLEAR statement is required for this string and does not need to be taken into account at the beginning of the programme.
Control: If you want to experiment with the computer's game try changing the first six values in line 1555. Lines 1560-1565 contain the graphic strings for human player and the computer. CHR$ (30) clears the print line instead of using 'PRINT@XX, STRING$(X,""). which seems a rather long-winded way of doing things.

The computer takes anything from 10 secs to 1 min to think about its move, especially at the beginning of the game because it has to calculate each position in the G$ (8,8) array.

```
5120 PRINT@960,"SORRY !! ILLEGAL INPUT.";:V=USR(32000):FORI=1TO400:NEXT:GOTO5060

5130 R=R(X):IFR>7THEN5110
5131 V=USR(31900)
5140 R(X)=R+1:R=R+1:G$(R,X)=H$:CR=GC(R,X):GOSUB 9000
5150 X$=H$::GOSUB60
5160 FORD=1TO4:IFA(D)<4THENGOTO5190ELSED=4
5170 FORI=1TO6:PRINT@960,"<<<<   O.K    YOU   WIN  !!!    >>>>";:V=USR(12800)
5180 FORJ=1TO150:NEXT
5181 PRINT@960,"<<<<                                    >>>>";:V=USR(23476):FORJ=1TO100
:NEXTJ,I
5182 GOTO10000
5190 NEXTD
5199 'COMPUTER MOVE
6000 P6=0:PRINT@960,CHR$(30);:PRINT@960,"THINKING ";:A=USR(12456)
6010 U=0:J=1
6020 FOR P=1TO8:R=R(P)+1
6030 IFR>8THEN 6181
6040 E=1:X$=C$:F=0:X=P
6045 GOSUB60
6050 FORL=1TO4:J(L)=0:NEXTL
6060 FORI=1TO4:A=A(I):IFA-F>3 I=4:GOTO7010
6070 Q=A+K(I):IFQ<4THEN 6090
6080 E=E+4:J(A)=J(A)+1
6090 NEXTI
6100 FORI=1TO4:W=J(I)-1:IFW=-1THEN 6130
6110 Z=8*F+4*SGN(W)+I
6120 E=E+G(Z)+W*G(8*F+I)
6130 NEXTI
6140 IF F=1 THEN 6155
6150 F=1:X$=H$:GOTO6045
6155 R=R+1:IFR>8THEN 6170
6160 GOSUB60
6165 FORI=1TO4:IFA(I)>3THENE=2:NEXTI
6170 IFE<UTHEN 6181
6171 IFE>UTHENO=1:GOTO6180
6175 O=O+1:IF RND(0)>1/O THEN 6181
6180 U=E:P6=P
6181 NEXTP
6185 IF P6<>0THEN 6200    ELSE PRINT@960,CHR$(30);
6190 PRINT@960,"** ITS  A  DRAW **";:V=USR(23199):FOR I=1TO 1000:NEXT
6195 GOTO 10000
6200 X=P6
7000 PRINT@960,CHR$(30);
7010 PRINT@960,"I AM GOING IN COLUMN ";X;:V=USR(6012)
7020 FORI=1TO1000:NEXT
7030 R=R(X)+1:R(X)=R(X)+1
7040 G$(R,X)=C$
7050 X$=C$
7055 CR=GC(R,X):GOSUB9000
7058 GOSUB60
7060 FORI=1TO4:IFA(I)<4THEN NEXTI :GOTO5040
7061 I=4
7065 PRINT@960,CHR$(30);
7070 FORI=1TO8:PRINT@960,"<<<< SORRY  i  WIN  >>>>";:V=USR(8618)
7075 FORJ=1TO200:NEXTJ
7080 PRINT@960,"< <     HA!  HA!    > > ";:V=USR(31440):FORJ=1TO200:NEXTJ,I
7090 GOTO10000
8000 NEXTI
9000 IFG$(R,X)=H$THEN F$=H$
9010 IFG$(R,X)=C$ THEN F$=C$
9020 PRINT@CR,F$;:IFF$=H$THENV=USR(256*70+150)ELSEV=USR(256*10+120)
9030 RETURN
10000 PRINT@960,CHR$(30);
10010 PRINT@960,"DO YOU WANT TO PLAY AGAIN ?"
10020 IN$=INKEY$
10030 IF IN$=""THEN10020
10040 IFIN$="N"THEN V=USR(8900):END
10050 V=USR(7000):V=USR(32000):RUN
```

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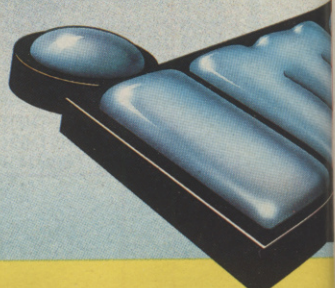

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dly aliens
ly towards your space
adly intent.
u have dual Plasma Disruptors and
rust Drive haven't you?

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playfield and sensational sound effects.
Keyboard or joystick.
Game design and software by D. H. Lawson.

for any ZX SPECTRUM.
It's my own fault, I even volunteered.
I thought that with the space-dozer and its shovel and skyhook
it would be easy shifting the galaxy's rubbish.
Childs play. HUH! They warned me of the weird packaging,
the trays, the rods, and all the rest.
But they didn't say I'd have to stop and control not just one but two
or even more garbage pods. Then prod them, push
them, toward that black hole, and oh, it's so very, very
black, and so lonely, so empty.
Panic, mustn't panic, but they won't stop, twirling and
spinning and turning, always turning, towards me, against
me, at me. And I'm alone.
No way out, nowhere to hide, on my own, my own . . . own . . .
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Game design and Software by Peter Paranoid and
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fast buck. With crazy guests screaming for
service you're gonna have to be
quick to pick up the tips, don't slop the drinks,
as you dodge the drunks and
dart from elevator to elevator, coz if the Boss
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Game design and
software by
Eugene Evans.

WACKY WAITERS

IDS

Imagine

..the name of the game

Illustrations: Jon Davis

LISTING 1

```
10 REM  DOCTOR WHO ADVENTURE
        INSTRUCTIONS
20 DATA 28,8,28,62,93,28,20,20
30 DATA 0,0,0,224,191,226,5,0
40 DATA 0,0,0,64,255,64,0,0
50 DATA 0,0,0,64,160,64,0,0
60 DATA 0,0,0,224,160,224,16,0
70 DATA 0,0,64,112,128,0,0,0
80 DATA 0,0,32,80,248,0,0,0
90 DATA 8,8,93,62,28,28,20,20
100 DATA 0,224,32,32,38,36,36,60
110 DATA 0,0,64,196,60,60,68,0
120 DATA 0,127,127,127,0,247,247,247
130 DATA 192,216,216,216,24,216,216,216
140 DATA 3,27,27,27,24,27,27,27
150 DATA 255,255,255,255,255,255,255,255
160 DATA 3,6,12,24,48,96,192,128
170 DATA 126,98,102,106,114,98,98,126
180 DATA 24,56,24,24,24,24,60,126
190 DATA 126,98,6,60,96,96,102,126
200 DATA 126,102,6,28,6,6,102,126
210 DATA 124,100,100,100,126,12,12,12
220 DATA 126,64,64,124,6,102,102,60
230 DATA 60,102,96,124,102,102,102,60
240 DATA 126,98,98,12,24,24,24,24
250 DATA 60,102,102,60,102,102,102,60
260 DATA 62,98,98,98,62,6,6,6
270 DATA 240,240,240,240,240,240,240,240
280 DATA 15,15,15,15,15,15,15,15
290 DATA 24,60,126,126,60,60,126,126
300 DATA 0,0,126,0,0,126,0,0
310 DATA 96,48,24,12,24,48,96,0
320 DATA 126,102,6,30,24,24,0,24
330 DATA 60,90,165,195,195,165,90,60
340 DATA 0,60,102,102,126,102,102,0
350 DATA 0,124,102,124,102,102,124,0
360 DATA 0,60,102,96,96,102,60,0
370 DATA 0,124,54,50,50,54,124,0
380 DATA 0,126,96,120,96,102,126,0
390 DATA 0,126,54,48,124,48,48,0
400 DATA 0,62,102,96,110,98,60,0
410 DATA 0,102,102,126,102,102,102,0
420 DATA 0,126,24,24,24,24,126,0
430 DATA 0,126,12,12,76,108,56,0
440 DATA 0,102,108,120,108,102,102,0
450 DATA 0,48,48,48,48,114,126,0
460 DATA 0,99,119,127,107,99,99,0
470 DATA 0,102,118,126,110,102,102,0
480 DATA 0,60,102,102,102,102,60,0
490 DATA 0,124,54,54,124,48,48,0
500 DATA 0,60,98,98,106,100,58,0
510 DATA 0,124,54,54,124,54,54,0
520 DATA 0,62,96,60,6,102,60,0
530 DATA 0,126,90,24,24,24,24,0
540 DATA 0,102,102,102,102,102,60,0
550 DATA 0,102,102,102,102,52,24,0
560 DATA 0,98,98,106,126,118,102,0
570 DATA 0,102,102,28,56,102,102,0
580 DATA 0,102,102,62,6,102,60,0
590 DATA 0,126,12,24,48,102,126,0
600 DATA 0,112,96,96,96,96,112,0
610 DATA 192,96,48,24,12,6,3,1
620 DATA 0,30,6,6,6,6,30,0
630 DATA 60,126,255,255,255,255,255,255
640 DATA 0,0,3,60,192,0,0,0
900 FOR T=0 TO 503:READ A:POKE 14856+T,A
:NEXT T
1000 GRAPHICS 17:POKE 756,58:POKE 708,20
:POKE 709,198:POKE 710,148:POKE 711,55:P
OKE 712,26:POKE 752,1
1010 ? #6:? #6;"++++++++++++++++++++DocT
Or wHO adVEntURe++++++++++++++++++++";
1020 ? #6;",i-";CHR$(129);"+++++++DOCTOR
,i-";
1030 ? #6;",N-";CHR$(2);"++++++++++KEY,N
-";
1040 ? #6;",S-";CHR$(3);"+++++++++SWORD,S
-";
1050 ? #6;",t-";CHR$(4);"+++++++++RING,t
-";
1060 ? #6;",r-";CHR$(5);"+++++++++ROPE,r
-";
1070 ? #6;",U-";CHR$(6);"++++++RAY GUN,U
-";
1080 ? #6;",C-";CHR$(7);"+++TIME DRIVE,C
-";
1090 ? #6;",t-";CHR$(60);"+++MUMMY CASE,
t-";
1100 ? #6;",i-";CHR$(40);"++++++++MUMMY,
i-";
1110 ? #6;",O-";CHR$(137);"++++++++SNAKE
,O-";
1120 ? #6;",N-";CHR$(42);"+++++++SPHINX,
N-";
1130 ? #6;",s-";CHR$(161);"+++++++MASTER
,s-";
1140 ? #6;"++++++++++++++++++++By jERemY
 GugGEnhEIm";
1150 ? #6;"++++++++++++++++++++LoaDIng M
Ain PRogRAm++++++++++++++++++++"
2000 POKE 764,12:CLOAD
```

RUNS ON AN ATARI 400/800 IN 16K WITH JOYSTICK

Dr Who Adventure

BY JEREMY GUGGENHIEM

Another time, another place . . . the Doctor is on the move again and this time you can become one of his travelling companions.

This graphics adventure is based on the classic sci-fi TV series Dr Who. In it the good Doctor is trapped on the planet Strardos IV in a pyramid built by his arch-enemy, the Master.

The Master plans to destroy the planet — and the Doctor — with a time bomb. He has stolen the Doctor's time drive unit from the Tardis — and without this the Doctor cannot escape the doomed planet. He must get it back — but he can only do this by killing the Master.

You take the role of the Doctor — everything else is controlled by the computer. There are 12 rooms within the pyramid which you must explore in your attempt to escape.

Some of the rooms contain things you will need to escape — some contain hazards which you must overcome.

Objects you need are hidden in mummy cases — but be careful, some of the cases contain angry mummies who do not want to be disturbed! The position of mummies and mummy cases differs each time you play the game.

You can drop an object you are carrying in an empty room by pressing the fire button on the joystick which you also use to control your movements. These objects are replaced in mummy cases when you leave the room.

The time left before the bomb explodes and the number of the room you are in are shown at the bottom of the screen.

Objects you will need in your escape bid are the key to the Master's Tardis, which is contained in a mummy case somewhere in the pyramid; a sword from the High Priest's temple which will protect you against snakes and the Sphinx; a magic ring, which protects you against any stray thunderbolts; a rope, which will come in useful if you fall into any pits; a ray gun, which you will find in a pit, and your time drive which is in the Master's Tardis.

Deadly dangers which you must avoid or defeat if you are to survive include mummies and snakes. And don't leave the key in the Master's Tardis — you'll never get back in!

LOADING AND CLOADING

Because this program includes instructions which are shown while the other program is loading the loading and saving procedures are slightly different from normal. To load the program type: RUN "C:" (and press RETURN)

The program will load and when ready will say "READY". You should then type "RUN" and the program will run.

To save the instruction program either load it off the tape by typing "CLOAD" instead of "RUN"C:"" and when it is ready type "SAVE"C:"", or write out the listing and type "SAVE "C:"".

When the instructions have been saved (using SAVE "C:") you can save the main program. You do this by either writing out the listing of loading the program from tape and then, DIRECTLY after the instruction program, you CSAVE the program in the normal way.

Now, when you RUN"C:" the instruction program, the program will immediately run without having to type anything. Then line 2000 tells the computer to load the main program will still keeping the instructions on the screen.

There are two main advantages of having the two different programs. The first is that the instructions can be read in plenty of time while you are waiting for the main program to load.

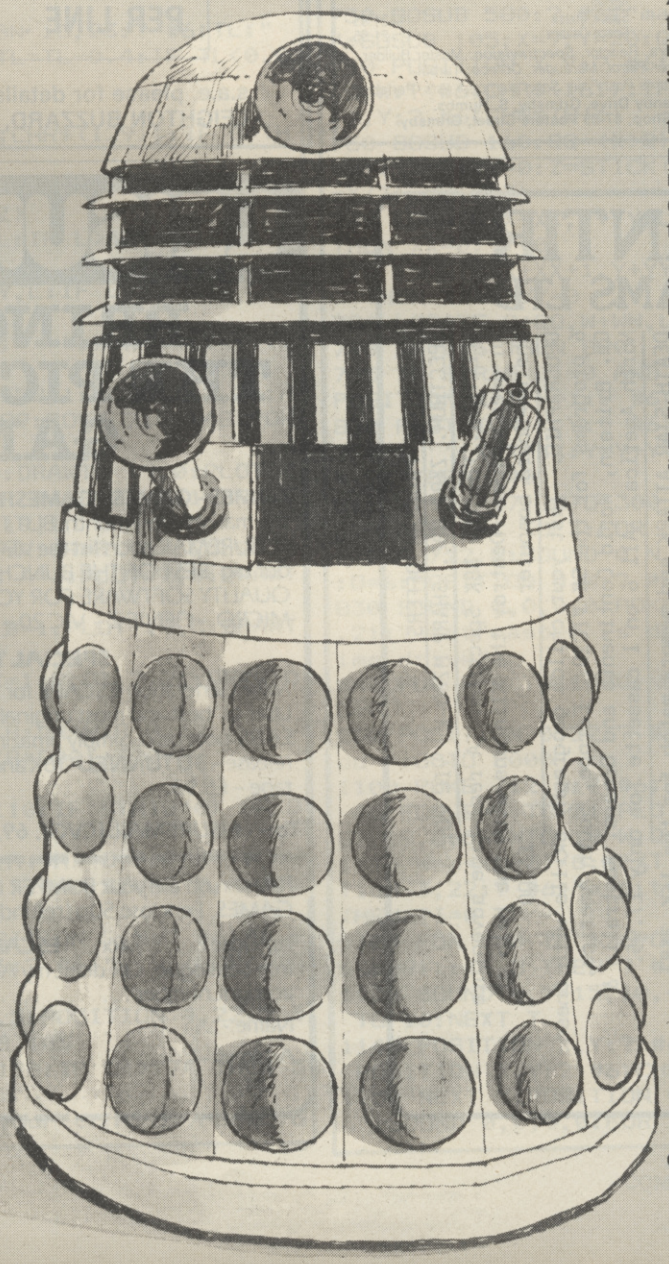
The second is that this method saves about 8 K of memory and a lot of time. This is because it creates a whole new custom character set before printing the instructions. The new set is kept in memory will you load the new program (even NEW does not affect it).

The memory used for the character set and instructions is cleared when the other program loads but the character set stays intact. Also the immensely tedious time it takes to build a new set is forgotten as this is done automatically when the instructions load.

However, there is a problem with the program, and this is that after 15-50 games (depending on their length) the character generation starts to get over written by RAM.

This seems impossible to solve. There may be a way but I do not know one perhaps someone out there can solve it?.

The character set RAM is held as high up in memory as I can get it without upsetting the Display List. The only thing to do when this happens is to re-load the whole program.



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.....

LISTING 2

```
5 CLR
10 DIM R(12),D(12),X(15),Y(15)
56 DATA 110,0,1110,0,1010,0,1000,1,101,5
,111,0,1110
60 DATA 0,1000,4,1,2,1,7,11,6,1000,8,1,1
,1,-1,1,0,0,0,-1,1,-1,-1,-1,0,0,0,0,1,0,
-1,0,0
80 FOR N=1 TO 12:READ A,B:D(N)=A:R(N)=B:
NEXT N:FOR N=5 TO 15:READ A,B:X(N)=A:Y(N
)=B:NEXT N
90 TL=30:X=9:Y=16:YR=4:O=0:SN=1:SL=1:PI=
1:MT=0:FOR T=1 TO 4:GOSUB 95:READ A:R(I)
=A:NEXT T:GOTO 300
95 I=INT(RND(0)*7)+1:IF R(I)=0 THEN RETU
RN
96 GOTO 95:DATA 10,11,14,15
100 POSITION 0,22:? #6;"doctor who adven
ture   TIME LEFT=":RETURN
105 POSITION 19,22:? #6;"    TIME LEFT="
:RETURN
110 IF A AND Y=0 THEN YR=YR-1:Y=20:GOTO
300
120 IF B AND X=18 THEN YR=YR+4:X=1:GOTO
300
130 IF C AND Y=21 THEN YR=YR+1:Y=1:GOTO
300
140 IF D AND X=0 THEN YR=YR-4:X=17:GOTO
300
150 RETURN
160 TL=TL-0.01:POSITION 13,23:? #6;TL;"
":IF TL=INT(TL) THEN TL=TL-0.4:IF TL<0.0
1 THEN 8000
170 RETURN
180 POSITION X,Y:? #6;CHR$(129);:IF O TH
EN ? #6;CHR$(O+1)
190 GOSUB 160:XX=0:YY=0:Z=STICK(0):IF Z<
15 THEN XX=X(Z):YY=Y(Z)
200 LOCATE X+XX,Y+YY,L:IF L>42 AND L<47
THEN XX=0:YY=0
210 LOCATE X+XX+1,Y+YY,L:IF L>42 AND L<4
7 THEN XX=0:YY=0
220 POSITION X,Y:? #6;"  ":X=X+XX:Y=Y+YY
:RETURN
300 GRAPHICS 17:POKE 752,1:POKE 712,26:P
OKE 708,19:POKE 709,199:POKE 710,148:POK
E 711,55:POKE 756,58
310 COLOR 43:PLOT 0,0:DRAWTO 19,0:PLOT 0
,21:DRAWTO 19,21:COLOR 44:PLOT 0,1:DRAWT
O 0,20:COLOR 45:PLOT 19,1
320 DRAWTO 19,20:D=D(YR):R=R(YR):COLOR 0
330 IF D/1000>=1 THEN A=1:PLOT 7,0:DRAWT
O 11,0:D=D-1000
340 IF D/100>=1 THEN B=1:PLOT 19,8:DRAWT
O 19,12:D=D-100
350 IF D/10>=1 THEN C=1:PLOT 7,21:DRAWTO
 11,21:D=D-10
360 IF D THEN PLOT 0,8:DRAWTO 0,12
370 IF R THEN GOSUB (R*200)+300
380 GOSUB 100
390 GOSUB 180:GOSUB 110:IF STRIG(0) OR O
=0 THEN 390
410 SOUND 0,100,10,4:R(YR)=O+7:POSITION
X+1,Y-1:? #6;CHR$(O+1):O=0:SOUND 0,0,0,0
:GOTO 390
500 FOR W=6 TO 13:POSITION 8,W:? #6;";.:
":NEXT W:POSITION 8,6:? #6;"...":POSITIO
N 8,14:? #6;"..."
510 COLOR 254:PLOT 9,5:POSITION 4,22:? #
6;"your tardis":GOSUB 105
520 GOSUB 180:GOSUB 110:IF L<>174 THEN 5
20
570 GOSUB 580:? #6;"your control room":G
OSUB 105:X=9:Y=20:GOTO 600
580 ? #6;CHR$(125):COLOR 46:PLOT 0,0:DRA
WTO 19,0:DRAWTO 19,21:DRAWTO 11,21:PLOT
7,21:DRAWTO 0,21:DRAWTO 0,0
590 POSITION 8,10:? #6;"/.\":POSITION 8,
11:? #6;".@.":POSITION 8,12:? #6;"\./":P
OSITION 0,22:RETURN
600 GOSUB 180:IF STRIG(0)=0 THEN 670
610 IF Y<21 THEN 600
660 X=9:Y=16:GOTO 300
670 IF O<>6 THEN POSITION 0,22:? #6;"can
t drop that here":FOR N=1 TO 500:NEXT N:
GOTO 570
680 FOR N=255 TO 0 STEP -3:POKE 708,N:PO
KE 712,255-N:POKE 709,RND(0)*N:SOUND 0,N
,10,5:SOUND 1,255-N,10,3
690 NEXT N:SOUND 1,0,0,0:POSITION 5,13:?
 #6;"score ";TL*100:GOTO 8020
700 FOR W=7 TO 14:POSITION 9,W:? #6;".":
NEXT W:POSITION 8,15:? #6;";.:":POSITION
 8,6
710 ? #6;";.:":POSITION 0,22:? #6;"maste
rs tardis":GOSUB 105
720 GOSUB 180:GOSUB 110:IF L<>46 THEN 72
0
725 IF MT=0 AND O<>1 THEN POSITION 0,22:
? #6;"need a key to get in":FOR N=1 TO 5
00:NEXT N:Y=16:GOTO 300
730 GOSUB 580:? #6;"masters control room
":GOSUB 105:X=9:Y=20:Q=17:W=10
740 POSITION X,Y:? #6;CHR$(129):POSITION
 Q,W:? #6;CHR$(161):IF O THEN POSITION X
+1,Y:? #6;CHR$(O+1)
750 GOSUB 160:QQ=(X>Q)-(X<Q):WW=(Y>W)-(Y
<W):XX=0:YY=0:Z=STICK(0):IF Z<15 THEN XX
=X(Z):YY=Y(Z)
760 LOCATE X+XX,Y+YY,L:IF L>42 AND L<47
THEN XX=0:YY=0
770 LOCATE X+XX+1,Y+YY,L:IF L>42 AND L<4
7 THEN XX=0:YY=0
780 LOCATE Q+QQ,W+WW,L:IF L=129 THEN 850
790 IF L=6 THEN 820
795 IF STRIG(0)=0 AND O=1 THEN MT=1:O=0:
POSITION X+1,Y-1:? #6;CHR$(2)
800 POSITION X,Y:? #6;"  ":POSITION Q,W:
? #6;" ":X=X+XX:Y=Y+YY:Q=Q+QQ:W=W+WW:IF
Y<21 THEN 740
810 X=9:Y=17:GOTO 300
820 FOR T=1 TO 3:FOR N=255 TO 0 STEP -10
:POKE 712,N:SOUND 0,N,10,5:NEXT N:NEXT T
:O=6:POSITION Q,W:? #6;" "
830 SOUND 0,0,0,0:POKE 712,26:POSITION 0
,21:? #6;"master is dead  you have the t
ime drive"
840 FOR N=0 TO 1000:NEXT N:R(YR)=0:GOTO
300
850 POSITION 0,22:? #6;" he has killed y
ou ":GOTO 8000
1100 POKE 712,6:? #6;CHR$(125):W=0:COLOR
 46:FOR Q=5 TO 21:PLOT 0,Q:DRAWTO W,Q:PL
OT 19,Q:DRAWTO 19-W,Q:X=9
1110 W=W+(Q-5)/8:NEXT Q:POKE 710,10:POSI
TION 3,22:? #6;"a pit":GOSUB 105:IF O=4
THEN PI=0
1120 FOR Y=0 TO 17:POSITION X,Y:? #6;CHR
$(129);:IF O THEN ? #6;CHR$(O+1)
1130 SOUND 0,Y*15,10,4:GOSUB 160:FOR T=1
 TO 10:NEXT T
1140 POSITION X,Y:? #6;"  ":IF PI=0 THEN
 POSITION X,Y:? #6;CHR$(186)
1150 NEXT Y:POSITION 0,22:? #6;"a ray gu
n":SOUND 0,0,0,0:FOR T=1 TO 500:NEXT T
```

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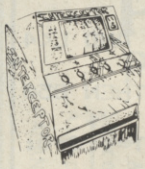

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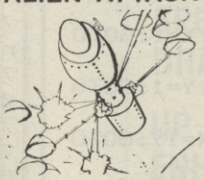

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FANTAZIA
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WATCH THIS SPACE

* JOYSTIX SHOWN NOT INCLUDED

```
1160 POSITION 0,22:IF PI THEN ? #6;"you
are trapped":GOTO 8000
1170 ? #6;"climb up the rope":O=5:FOR Y=
17 TO 0 STEP -1:POSITION X,Y:? #6;CHR$(1
29);CHR$(6)
1180 GOSUB 160:SOUND 0,Y*15,10,4:FOR T=1
 TO 10:NEXT T:POSITION X,Y:? #6;"  ":NEX
T Y:Y=20:YR=7:GOTO 300
1300 ? #6;CHR$(125):POKE 712,194:COLOR 4
6:PLOT 0,21:DRAWTO 19,21:FOR T=0 TO 3:PL
OT 0,T+17:DRAWTO T,T+17
1310 PLOT 19,T+17:DRAWTO 19-T,T+17:NEXT
T:POSITION 5,22:? #6;"a snake pit":GOSUB
 105
1320 M=4:M=M+(X>5)*10:X=M:Q=15
1330 POSITION X,20:? #6;CHR$(129);:IF O
THEN ? #6;CHR$(O+1)
1335 IF SL THEN POSITION Q,20:? #6;CHR$(
137):QQ=(X>Q)-(X<Q)
1340 GOSUB 160:XX=0:Z=STICK(0):IF Z<15 T
HEN XX=X(Z)
1350 IF X+XX=3 OR X+XX=15 THEN 1400
1360 IF SL THEN LOCATE Q+QQ,20,L:IF L=12
9 THEN POSITION 2,22:? #6;"the snake bit
 you":GOTO 8000
1370 IF SL AND L=3 THEN 1450
1380 POSITION X,20:? #6;"  ":X=X+XX:IF S
L THEN POSITION Q,20:? #6;" ":Q=Q+QQ
1390 FOR T=1 TO 50:NEXT T:GOTO 1330
1400 FOR Y=20 TO 16 STEP -1:POSITION X,Y
:? #6;CHR$(129);:IF O>1 THEN ? #6;CHR$(O
+1)
1410 SOUND 0,Y*10,10,4:FOR T=1 TO 40:NEX
T T:SOUND 0,0,0,0:POSITION X,Y:? #6;"  "
:X=X+XX:NEXT Y
1420 Y=9:YR=YR-(X<5)*4+(X>15)*4:M=(X<5)*
17+(X>15)*1:X=M:GOTO 300
1450 SL=0:POSITION 0,22:? #6;"you killed
 the snake":FOR T=100 TO 200:SOUND 0,T,1
0,4:NEXT T:SOUND 0,0,0,0
1460 POSITION Q,20:? #6;" ":GOTO 1380
1500 IF SN=0 THEN 380
1510 Q=INT(RND(0)*8)+10:W=INT(RND(0)*15)
+2:POSITION 0,22:? #6;"a sphinx":GOSUB 1
05
1520 POSITION Q,W:? #6;CHR$(42):POSITION
 X,Y:? #6;CHR$(129);:IF O THEN ? #6;CHR$
(O+1)
1530 QQ=(Q<X)-(Q>X):WW=(W<Y)-(W>Y):XX=0:
YY=0:Z=STICK(0):IF Z<15 THEN XX=X(Z):YY=
Y(Z)
1540 LOCATE Q+QQ,W+WW,L:IF L=129 THEN 16
00
1550 GOSUB 110:GOSUB 160:IF L=3 THEN 165
0
1560 LOCATE X+XX,Y+YY,L:IF L>42 AND L<46
 THEN XX=0:YY=0
1570 LOCATE X+XX+1,Y+YY,L:IF L>42 AND L<
46 THEN XX=0:YY=0
1580 POSITION Q,W:? #6;" ":Q=Q+QQ:W=W+WW
:POSITION X,Y:? #6;"  ":X=X+XX:Y=Y+YY:GO
TO 1520
1600 POSITION 0,22:? #6;"the sphinx got
you":GOTO 8000
1650 SN=0:POSITION 0,22:? #6;"the sphinx
 is dead":FOR T=100 TO 200:SOUND 0,T,10,
4:NEXT T:SOUND 0,0,0,0
1660 FOR T=0 TO 300:NEXT T:GOTO 300
1700 COLOR 43:PLOT 12,17:DRAWTO 16,17:PL
OT 11,18:DRAWTO 17,18:COLOR 163:PLOT 10,
17
1710 COLOR 168:PLOT 14,16:POSITION 0,22:
? #6;"high priest s temple":GOSUB 105:Q=
13:W=16
1720 POSITION X,Y:? #6;CHR$(129);:IF O T
HEN ? #6;CHR$(O+1)
1730 POSITION Q,W:? #6;CHR$(95):XX=0:YY=
0:Z=STICK(0):IF Z<15 THEN XX=X(Z):YY=Y(Z
)
1740 GOSUB 110:GOSUB 160:LOCATE Q-1,W,L:
IF L=129 THEN 1800
1745 IF X=9 AND Y=17 THEN O=2:POSITION 0
,22:? #6;" you have the sword "
1760 LOCATE X+XX,Y+YY,L:IF L>42 AND L<46
 THEN XX=0:YY=0
1770 LOCATE X+XX+1,Y+YY,L:IF L>42 AND L<
46 THEN XX=0:YY=0
1780 POSITION X,Y:? #6;"  ":POSITION Q,W
:? #6;" ":X=X+XX:Y=Y+YY:Q=Q-1:IF Q>0 THE
N 1720
1790 Q=9:W=Y:GOTO 1720
1800 POSITION 0,22:? #6;"a lightning bol
t hityou":IF O<>3 THEN 8000
1810 SOUND 0,200,10,4:FOR T=1 TO 300:NEX
T T:POSITION 0,22:? #6;"the ring saved y
ou      ":SOUND 0,0,0,0
1820 FOR T=1 TO 300:NEXT T:GOTO 300
1900 GOSUB 1910:? #6;"master s tardis ke
y":GOTO 390
1910 POSITION 9,9:? #6;"<":POSITION 0,22
:? #6;"a mummy case":GOSUB 105
1920 GOSUB 180:GOSUB 110:IF X<>8 OR Y<>9
 THEN 1910
1930 IF R=14 OR R=15 THEN 1950
1940 V=O:O=R(YR)-7:R(YR)=V+7-(V=0)*7:POS
ITION X,Y:? #6;"  ":Y=Y-1:POSITION 0,22:
GOSUB 3000:RETURN
1950 POSITION 8,22:? #6;"     ":Q=11:W=11
1960 POSITION Q,W:? #6;CHR$(40):POSITION
 X,Y:? #6;CHR$(129);:IF O THEN ? #6;CHR$
(O+1)
1970 GOSUB 110:GOSUB 160:Z=STICK(0):QQ=(
Q<X)-(Q>X):WW=(W<Y)-(W>Y):XX=0:YY=0:IF Z
<15 THEN XX=X(Z):YY=Y(Z)
1980 LOCATE X+XX,Y+YY,L:IF L>42 AND L<46
 THEN XX=0:YY=0
1990 IF X=Q AND Y=W THEN POSITION 0,22:?
 #6;"the mummy got you":GOTO 8000
2000 LOCATE X+XX+1,Y+YY,L:IF L>42 AND L<
46 THEN XX=0:YY=0
2010 POSITION Q,W:? #6;" ":Q=Q+QQ:W=W+WW
:POSITION X,Y:? #6;"  ":X=X+XX:Y=Y+YY:GO
TO 1960
2100 GOSUB 1910:? #6;"a sword":GOTO 390
2300 GOSUB 1910:? #6;"a magic ring":GOTO
 390
2500 GOSUB 1910:? #6;"some rope":GOTO 39
0
2700 GOSUB 1910:? #6;"a ray gun":GOTO 39
0
2900 GOSUB 1910:? #6;"the time drive uni
t":GOTO 390
3000 ? #6;"                    ":POSITIO
N 0,22:RETURN
3100 GOTO 1910
3300 GOTO 1910
8000 COLOR 43:FOR W=21 TO 0 STEP -1:FOR
Q=0 TO 19:SOUND 0,255,10,4:PLOT Q,W:SOUN
D 0,0,0,0:NEXT Q:NEXT W
8010 POSITION 5,5:? #6;" you lose ":? #6
;"the master will rule+++ the universe +
+":GOSUB 100
8020 POSITION 0,21:? #6;"press START to
begin":IF PEEK(53279)<>6 THEN 8020
8030 RESTORE 56:R(1)=0:R(2)=0:R(6)=0:R(7
)=0:RUN
```

```
0REM ********************
1REM *        SKIING     *
2REM *   S.J. HARRIS     *
3REM ********************
8REM  NEEDS AN ATOM WITH 5K PROGRAM AND 3K SCREEN MEMORY
9P.$21
10DIMLL10,SS10,PP20,OO20,B32,C32,W-1,SS2=-1:F.X=1TO2:DIMP-1
19REM CHARACTER PLOT
20[ASLA:ASLA:ASLA:TAX:LDY@0:.LL0LDA£2800,X:EOR£88:STA(£8B),Y
21INX:TYA:CLC:ADC@16:TAY:CMP@128:BNELL0:RTS
26\SCROLL SCREEN
27.LL2LDA@£81:STA£81:LDA@0:STA£80:.LL1LDY@128:LDA(£80),Y:LDY@0
28STA(£80),Y:.INC£80:BNELL1:INC£81:LDA£81:CMP@£8C:BNELL1:RTS
29.LL10LDX@0:.LL3LDA8,X:STAC,X:INX:CPX@16
30BNELL3:RTS:.LL9LDA£328:CMP@255:BNELL4:LDA@0:STA£328
31STA635:STA862:STA889:.LL4CMP@16:BNELL5:LDA@15:STA£328:.LL5RTS
32]:GOS.e:[:SS0LDA@£60:STA£80:LDA@£88:STA£81:LDY@0:STY£83
33.SS1LDA(£80),Y:CMP@£FD:BNESS2:CPY£328:BMISS3:DEC£83:JMPSS2
34.SS3INC£83:.SS2INY:.CPY@16:BNESS1:RTS
35]
36N.:P=£2800:GOS.20000:REM CHARACTERS
37!P=£F8081010:P!4=£FE302030:P!8=£3056C810:P!12=£20905834
38P!16=£38381010:P!20=£28283854:P!24=£2C1A1C08:P!28=£4091A2C
39P!32=£1F100808:P!36=£7F0C040C:P!40=£FE7E0E02:P!44=£2020232
40P!48=£181818C8:P!52=£7E3C3C3C:P!56=£FFFF7E7E:P!60=£1010D8FF
41!£64=P:F.X=0TO15:X?B=8:X?C=8:N.:P!64=0:P!68=0
42F.J=1TOD:@=3:P.$12"PLAYER"J:IN.",WHAT IS YOUR NAME ",$PPJ
43CLEAR3:F.X=£8100TO£8D00S.4:!X=-1:N.:!£B0=0
44G=8:V=2:!£84=P:?£88=-1
45F.X=76TO148S.8:P!X=£FE:N.:P!72=£828282FE:P!80=£4040404:P!84=4
46P!88=£80FE02FE:P!96=£2FE02FE:P!104=£2FE8202:P!108=2:P!132=4
47P!112=£2FE80FE:P!120=£82FE80FE:P!128=£20202FE:P!136=£82FE82FE
48P!144=£2FE82FE:P!168=0:P!172=£15AA552A:P!176=0:L=0:O=0:F=5
49!160=-1:!164=-1:P!180=£54A85A00:P!184=0:P!188=£54AA5414
50F.X=0TO15:X?B=8:IFX?C=6 X?B=7
51N.:IFA.R.%10=1 Q=A.R.%13:B?Q=21:B?(Q+1)=22:B?(Q+2)=23
52IFA.R.%10=1:B?F=5:B?(F+5)=5:F=F+R.%4:F=(A.F)%10:G.54
53F.X=1TOA.R.%3:T=A.R.%16:T?B=6:N.:LI.SS7
54F.X=0TO15:?£8B=X:?£8C=£8B:A=X?B:LI.W:N.
55A=20:?£8B=G:?£8C=£88:IF?£B001&128=0V=V-1:IFV<0V=0
56LI.W:IF?£B002&64=0V=V+1:IFV>4V=4
57N=50
59IFV=0G=G-1:N=55:GOS.d:G.68
60IFV=1G=G-1
```

SKI-

The air is cold and clear. Below, the snow-clad mountain lies silent. The slopes shimmer in the harsh light of the sun. The obstacle course you must navigate to remain champion is hidden from view by all this deceptive beauty.

Taking a deep breath you thrust yourself forward, determined to smash all existing records. Snow sings beneath your skis as you bob and weave to miss trees and hidden patches of ice. Eyes ache as they strain to pick out the flags you must pass between. Each obstacle hit or flag missed earns you a penalty of five seconds. Can you do it in the time required to retain the crown?

This game written for the 12K Atom includes all the exciting features of the popular arcade game. You can compete with up to sixteen other players. A rundown of all the times is given at the end of each competition. During each individual run, time readout is displayed at the top right of the screen.

The only controls used are SHIFT for left turns and REPT for right turns.

-ING

BY S. J. HARRIS

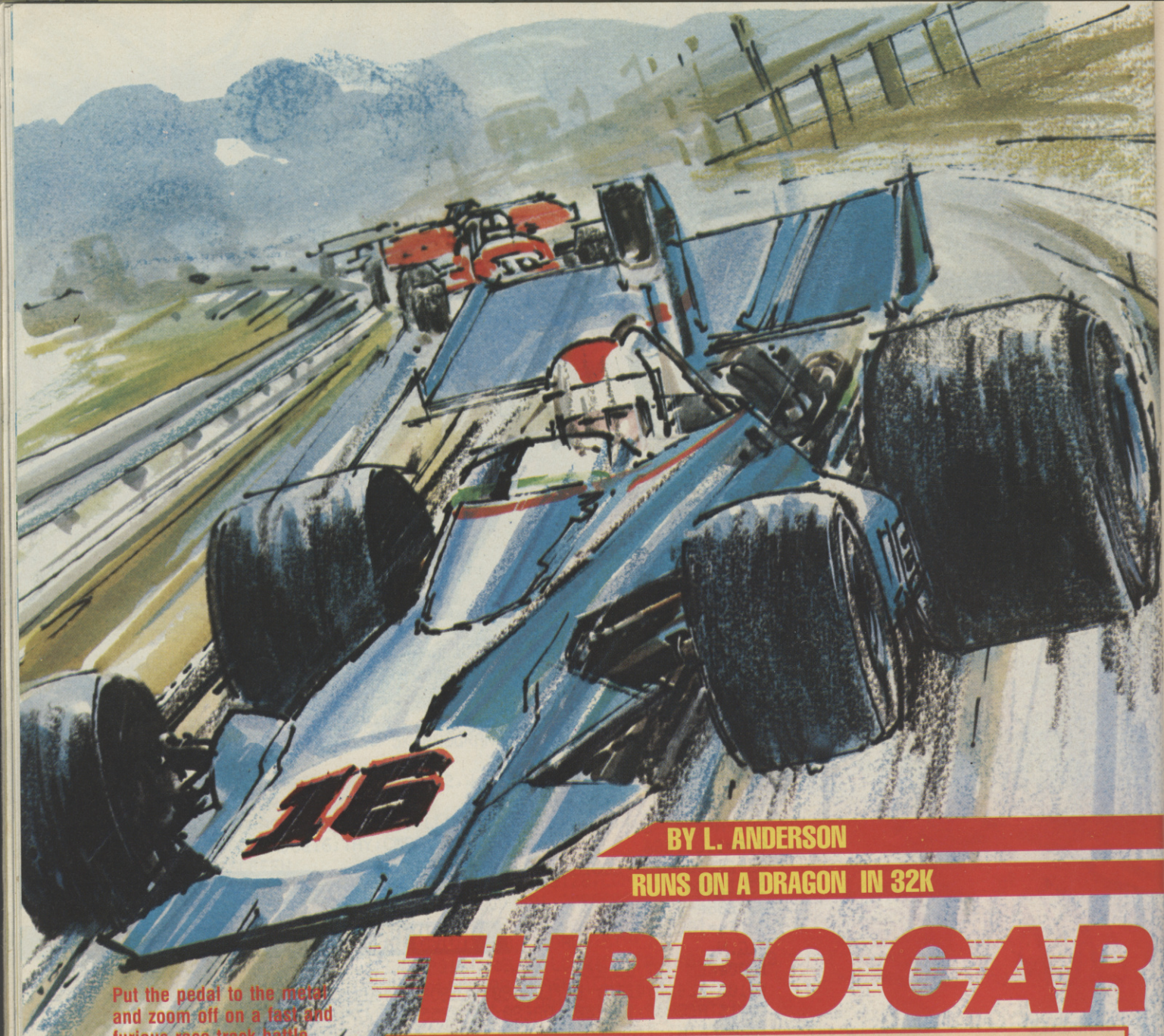
RUNS ON AN ATOM IN 12K

VARIABLES

A: Passes parameters to machine code.
B: Contains the next row of characters to be printed.
C: Contains the last row of characters to be printed.
D: Number of players.
F: Positions of next flags.
G: Position of skier across the screen.
J: Player number.
L: Distance down the slope.
M: String locations for names.
N: Line number (either 50 or 55) depending on whether skier moves or not.
O: Final score.
P: Assembly position counter and start of characters.
Q: Position of ice.
R: Delay loop counter.
T: Trees position.
V: Direction of skier.
W: Address of character plot routine.
X: General loop counter.
LLx: Assembly labels.
OOx: Times.
PPx: Name strings.
SSx: Assembly labels.

```
61IFV=3G=G+1
62IFV=4G=G+1;N=55;GOS.d;G.68
63LI.LL2;LI.LL10
66LI.LL9
70A=V;?£8C=£88;?£8B=G;U=?(£8850+G);LI.SS0
71IFU=255;?£8E=0;?£8D=5
72IFU<255LI.LL6;A=5;LI.SS6
73IF?£83>0A=5;LI.SS6
75LI.SS9
80IFN<>55L=L+1
81A=1;LI.SS6
82?£8B=G;?£8C=£88;A=V;LI.W;?£88=0
83LI.SS4
89?£88=-1
90IFL=100G.1900
91G.N
1000eREM HIT OBJECT
1010[:LL6LDY@£FF;:LL7LDX£80;:LL8DEX;BNELL8;LDA£B002;EOR@4
1011STA£B002;INC£80;LDA£80;CMP@255;BNELL7;RTS
1020\PRINT TIME
1021:SS4LDA@£2A;STA£8B;LDA@£80;STA£8C;LDA@1;STA£8D;:SS5LDX£8D
1022LDA£B0,X;LSRA;LSRA;LSRA;LSRA;CLC;ADC@09;JSRW;LDX£8D;INC£8B
1023LDA£B0,X;AND@15;CLC;ADC@09;JSRW;DEC£8D;INC£8B;LDA£8D
1024CMP@£FF;BNESS5;RTS
1029\ADD 'A' TO SCORE (BCD)
1030:SS6SED;CLC;ADC£B0;STA£B0;LDA@0;ADC£81;STA£B1;CLD;RTS
1039\PRINT NEW LINE OF CHARS
1040:SS7LDX@0;STX£8D;LDA@000;STA£8B;LDA@£BB;STA£8C;:SS8LDX£8D
1041LDA8,X;JSRW;INC£8B;INC£8D;LDA£8D;CMP@16;BNESS8;RTS
1049\READ SCREEN UNDER SKIER
1050:SS9LDX@0;LDY£328;STX£80;LDA@£08;STA£81;:SS10LDA(£80),Y
1051EOR@255;STA£28A0,X;INX;TYA;CLC;ADC@16;TAY;CPX@8;BNESS10;RTS
1060];R.
1899REM REACHED BOTTOM
1900!£8B=G+£8000;F.X=1TO12;A=8;LI.W;LI.LL2;A=2;LI.W;WAIT;WAIT
1901N.;O=!£B0&£FFFF
1999DO
2000A=8;LI.W;!£8B=!£8B+16;A=2;LI.W;WAIT;WAIT;U.!£86>£8870;GOS.d
2001P.$12$PPJ",YOU MANAGED A TIME OF";@=5;P.&O"SECONDS"''''
2002P."<HIT THE SPACE BAR TO CONTINUE>";LI.£FFC8;OOJ=O;N.
2500P.$12"THE FINAL SCORES ARE"''
2501F.J=1TOD;F.X=1TO20-LENPPJ;P." ";N.;P.$PPJ,&OOJ';N.;E.
10000d"F.R=1 TO15;WAIT;N.;R.
20000P.$@$12;IN."HOW MANY PLAYERS "D;IFD<1ORD>16G.20000
20001M=£8A00;F.X=1TOD;PPX=M;M=M+32;N.;R.
```

Illustration: Terry Rogers



BY L. ANDERSON

RUNS ON A DRAGON IN 32K

TURBO CAR

Put the pedal to the metal and zoom off on a fast and furious race track battle.

This is a version of that addictive arcade game where you control a high powered race car and attempt to dodge traffic coming at you along the track.

The car is controlled by the Dragon's "m" and "n" keys. The longer you survive on the road the more points you earn. The authors high score stands at 639 — can anyone beat it?

Variables

HI: high score. CR: ASCII code for road background. FF: width of road. DL: difficulty level (1-5). YS: your car. Y: your position. A: position of road. B: variable to move road left, right or middle.

```
10 POKE&HFFD7,0
20 CLS0
30 REM TURBOCAR BY L.ANDERSON
40 REM START
50 CLEAR 100
60 HI=500:HI$="KILROY"
70 CR=73
80 INPUT"SELECT DIFFICULTY(1-5)";DL:IF DL<1 OR DL>5 THEN 80 ELSE FF=8-DL*0.7
90 Y$=CHR$(253)+CHR$(248)
100 PLAY"T255L25502":CLS0:Y=16:A=496:B=1
110 FOR L=1 TO 1E6
120 G=(PEEK(&H158)=247)-(PEEK(&H157)=247)
130 Y=Y+G
140 IF RND(3)=2 THEN B=RND(3)-2
150 A=A+B
160 C=510.5-(A+FF):D=A-478
170 C$=STRING$(C,CR):D$=STRING$(D,CR)
180 IF A>507-FF THEN B=-1 ELSE IF A<482.5 THEN B=1
190 IF RND(3)+DL=2 THEN PRINT@A+RND(FF-1)-31,CHR$(RND(8)*16+127);
200 PRINT@481,D$;:PRINT@A,STRING$(FF+1,128);:PRINT@A+FF+1,C$
210 IF PEEK(1024+Y)<>128 OR PEEK(1025+Y)<>128 THEN 260
220 PRINT@Y,Y$;:PLAY"C
230 H=H+1:IF H=64 THEN H=1:CR=RND(8)*16+125
240 NEXT
250 GOTO 270
260 Y=Y+G:PRINT@Y,Y$;:FOR K=1 TO 20:SOUND RND(150),1:POKE 1024+Y,RND(120)+130:NE
XT:PRINT@Y,STRING$(2,239);:PLAY"L4T402CADFGA03E"
270 CLS3:PRINT"YOU SCORED"L"POINTS
280 IF L>HI THEN GOSUB 300
290 INPUT"DO YOU WANT ANOTHER GO(Y/N)";A$:IF LEFT$(A$,1)<>"N"THEN 70 ELSE END
300 PRINT:PRINT"YOU HAVE BEATEN THE HIGH SCORE  OF"HI"WHICH WAS HELD BY"HI$
310 HI=L
320 INPUT"PLEASE ENTER YOUR NAME";HI$:IF LEN(HI$)>6 THEN 320
330 RETURN
```

Illustration: Jon Davis

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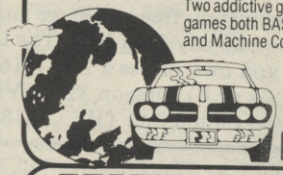

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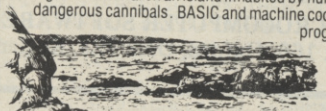

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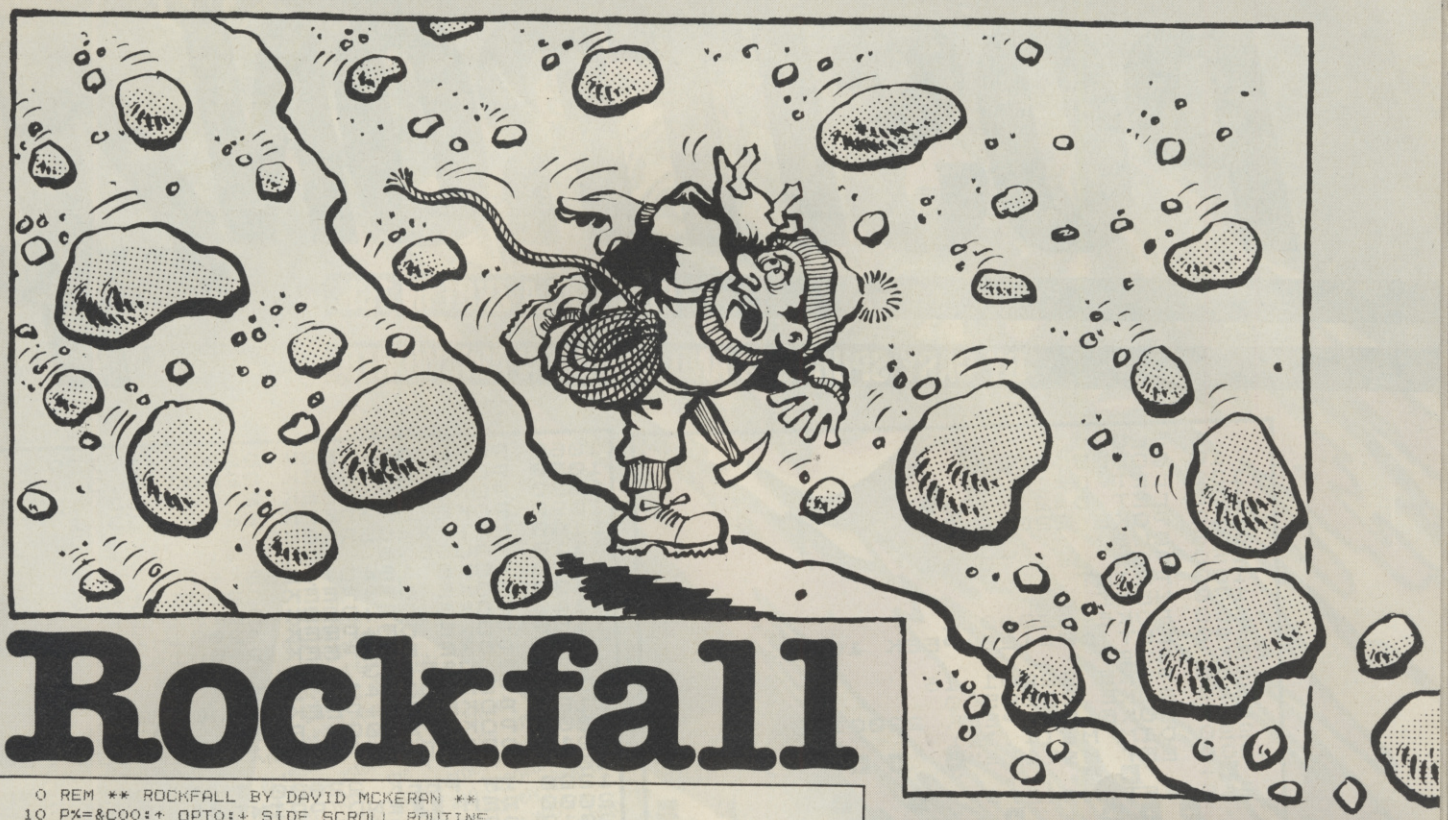

Rockfall

```
  0 REM ** ROCKFALL BY DAVID MCKERAN **
 10 P%=&C00:+ OPT0:+ SIDE SCROLL ROUTINE
 20 LDY#&FF:STY&72:INY:STY&74:STY&70
 30 LDX#&7B:STX&73:INX:STX&75:STX&71
 40 LDA#&20:STA(&74),Y:CLC:TYA:ADC#&28:TAY
 50 BCCP%-9:INC&75:BPLP%-13:LDY#&00
 60 LDA(&70),Y:STA(&72),Y:INY:BNEP%-5:INC&73:INC&71:BPLP%-11:RTS:+
 70 IFH%(OTHENH%=0
 80 B%=ASC"&":HIMEM=HIMEM-1
100 MODE7 :VDU23;8202;0;0;0; :ON ERROR GOTO 5000
110 PROCBIG("ROCKFALL")
120 PRINT'"THE OBJECT OF THE GAME IS TO TRY TO"
130 PRINT'"REACH THE RIGHT HAND EDGE OF THE SCREEN"
140 PRINT'"WITHOUT BEING HIT BY A FALLING ROCK".
150 PRINT''"MOVE LEFT AND RIGHT BY PRESSING THE"
160 PRINT'"ARROWED KEYS"'''"PRESS ANY KEY TO START" :X%=GET
200 S%=20 :XX%=0 :X%=0
210 R%=27 :L%=0
220 REM ** S%=Distance down screen
230 REM ** R%=Probability of rock
240 REM ** C%=Key repeat speed
300 VDU28,0,24,39,0 :XX%=XX%+X% :S%=S%-1 :IFS%=8THEN S%=9
310 CLS :PRINTTAB(0,24)"LONGEST ";H%;TAB(20)"DISTANCE ";XX%;TAB(0,0)
320 Y%=&7C00+S%*40 :?Y%=B% :L%=L%+1
330 PROCBIG("LEVEL "+STR$L%)
350 T%=TIME+150 :REPEAT :UNTILTIME=T%
360 R%=R%-2 :PRINTTAB(10,3)STRING$(60," ")
370 M%=255 :X%=0
500 REPEAT
510 P%=RND(39)-1 :O%=RND(38-P%)+P%
520 VDU28,P%,23,O%,0 :PRINT TAB(RND(38-P%),0);
530 Z%=Y%+X% :A%=?215AND127
540 IFA%()M%THEN600 ELSE IFC%=0THEN600 ELSE C%=C%-1 :GOTO800
600 M%=A% :C%=2 :X%=X%-(A%=121)+((A%=25)AND(X%)0))
610 IF?(Y%+X%)=255THEN ?Z%=32 :GOTO810
800 ?Z%=32 :IFRND(30))R% THEN VDU255,11 :ELSE VDU32,11
810 Z%=?(Y%+X%) :?(Y%+X%)=B%
820 $&7FDD=STR$(XX%+X%)
830 UNTIL X%=39 OR Z%=255
840 IFZ%=255 THEN 1000
900 FORZ%=1TO39 :CALL&C00 :FORM%=1TO30
910 NEXTM%,Z% :GOTO300
1000 ?(Y%+X%)=64 :VDU26 :PROCBIG("SPLAT!")
1010 T%=TIME+150 :REPEAT :UNTILTIME=T%
1020 XX%=XX%+X% :CLS :*FX15,0
1030 PRINT'''"YOU REACHED A "; :IFXX%-H%)250 THEN PRINT"STAGGERING ";
1040 IFH%-XX%)250 THEN PRINT"MEASLY ";
1050 PRINT"DISTANCE OF ";XX%''
1060 IFXX%(H% THEN PRINT"THE LONGEST RECORDED DISTANCE IS ";H% :GOTO2000
1070 IFXX%=H% THEN PRINT"YOU EQUALED THE RECORD!" :GOTO2000
1080 PRINT"YOU BEAT THE RECORD!" :H%=XX%
2000 A$=INKEY$(1000) :GOTO100
4000 DEFPROCBIG(A$) :FORZ%=3TO4
4010 PRINT TAB(18-LEN(A$)/2,Z%) CHR$141 A$ CHR$142
4020 NEXT :ENDPROC
5000 VDU23;29194;0;0;0;0,26
5010 PRINT
5020 IFERR()17 THEN REPORT :PRINT" in line ";ERL
```

Illustration: Terry Rogers

RUNS ON A BBC

MODEL A OR B IN 16K

BY DAVID McKERAN

Climbing mountains can be a dangerous pastime. There are many hazards — but the one most feared is an avalanche. A deluge of falling rocks can prove fatal . . .

The object of this game is to steer your climber across the screen while avoiding the falling rocks. The rocks fall at different speeds and densities — becoming increasingly harder as you get towards the edge of the screen. Once across you are whisked away to begin a harder screen.

The high score is not reset at the start of the game and may be cleared by entering H%=0.

Program notes

Lines 10-60: set up the machine code routine to scroll the screen sideways. (CALL and COO).

200-210: initialise variables at the start of a new game.

300-370: set up next screen.

500-830: plays the game until edge is reached or man is crushed.

POSITRON 4

RUNS ON A ZX81 IN 16K.

BY GARY SPURDENS AND HARRISON AINSWORTH

```
   5 SLOW
  10 GOSUB 8000
 130 LET D=10
 135 LET D=21-(D*2)
 140 POKE 22002,D
 145 CLS
 150 FOR J=1 TO 11
 160 PRINT ,,,,
 170 NEXT J
 180 POKE 22000,4
 190 LET DF=429+PEEK 16396+256*P
EEK 16397
 200 POKE 22001,16
 210 POKE 22005,0
 215 POKE DF+PEEK 22001,59
 220 DIM M$(4,32)
 230 LET M$(1)="■  ■ ■  + ■  ■
 ■+  ■ ■   +  "
 240 LET M$(2)="  ■   ■     ■  ■
   ■ ■ ■  +  ■  "
 250 LET M$(3)="   ■   ■ ■    ■■
 +  ■    ■  +  ■ ■  "
 260 LET M$(4)="  ■    ■    + ■
  ■   ■    +  ■  "
 270 LET M=INT (RND*4+1)
 280 LET LL=INT (RND*31+1)
 290 LET M$(M)=M$(M,LL TO )+M$(M
, TO LL)
 300 SCROLL
 310 PRINT M$(M)
 320 LET XX=USR 22014
 330 PRINT AT 0,5;"NP:";USR 2201
0;TAB 21;"L:";PEEK 22000
 350 LET O$=INKEY$
 350 IF O$="8" OR O$="0" THEN GO
TO 500
 365 POKE 22003,PEEK 22001
 370 IF O$="1" THEN POKE 22001,P
EEK 22001-1
 380 IF O$="3" THEN POKE 22001,P
EEK 22001+1
 390 IF PEEK 22001=1 THEN POKE 2
2001,2
 395 IF PEEK 22001=32 THEN POKE
22001,31
 400 POKE DF+PEEK 22003-33,27
 410 IF PEEK (DF+PEEK 22001)=149
 THEN GOTO 1000
 420 POKE DF+PEEK 22001,59
 440 GOTO 270
 500 REM ▮▮LASER FIRING▮▮
 510 LET MP=PEEK 22001-33+429
 515 LET DF=DF-429
 520 IF O$="8" THEN LET MP=MP+32
 530 IF O$="0" THEN LET MP=MP+34
 535 POKE 22004,PEEK (DF+MP)
 540 POKE DF+MP,11
 550 IF PEEK 22004=149 THEN POKE
 DF+MP,23
 560 IF PEEK 22004=21 THEN POKE
DF+MP,149
 590 POKE DF+MP,0
 600 IF PEEK 22004=21 THEN LET X
X=USR 22022
 610 IF NOT (PEEK 22004=149 OR M
P-INT (MP/33)*33=1 OR MP-INT (MP
/33)*33=32 OR MP>693) THEN GOTO
520
 620 PRINT AT 0,5;"NP:";USR 2201
0
 625 LET DF=DF+429
 630 GOTO 350
1000 REM ▮▮EXPLOSION▮▮
1010 LET X=USR 800
1020 POKE DF+PEEK 22001,23
1030 PAUSE 5
1040 POKE 16437,255
1050 LET X=USR 800
```

```
1060 POKE DF+PEEK 22001+1,129
1070 POKE DF+PEEK 22001-1,3
1080 POKE DF+PEEK 22001+33,133
1090 POKE DF+PEEK 22001-33,1
1100 LET X=USR 800
1110 PAUSE 8
1120 POKE 16437,255
1130 POKE DF+PEEK 22001+1+33,134
1140 POKE DF+PEEK 22001-1+33,6
1150 POKE DF+PEEK 22001-1-33,134
1160 POKE DF+PEEK 22001+1-33,6
1170 PAUSE 13
1180 POKE 16437,255
1190 POKE DF+PEEK 22001,8
1200 POKE 22000,PEEK 22000-1
1210 PRINT AT 1,21;"L:";PEEK 220
00
1220 IF PEEK 22000 THEN GOTO 270
2000 REM ▮▮END PRINT▮▮
2010 PRINT AT 0,0;M$(M)
2020 PRINT "                YOU ARE DE
AD                "
2030 PRINT AT 20,0;" YOU TRAVELL
ED ";USR 22010;" NANO-PARSECS"
2040 PAUSE 42000
2050 POKE 16437,255
2060 SCROLL
2070 SCROLL
2080 SCROLL
2090 PRINT AT 20,5;"? ANOTHER GO
 ?"
2100 PRINT TAB 8;"(Y OR N)"
2110 PAUSE 42000
2120 POKE 16437,255
2130 CLS
2135 GOSUB 8140
2140 IF INKEY$<>"N" THEN RUN 130
2150 STOP
8000 REM ▮▮INSTRUCTIONS▮▮
8010 PRINT ,,"▮  ▮  ▮▮▮INSTRUCT
IONS▮▮▮  ▮  ▮"
8020 PRINT "▒▒▒
```

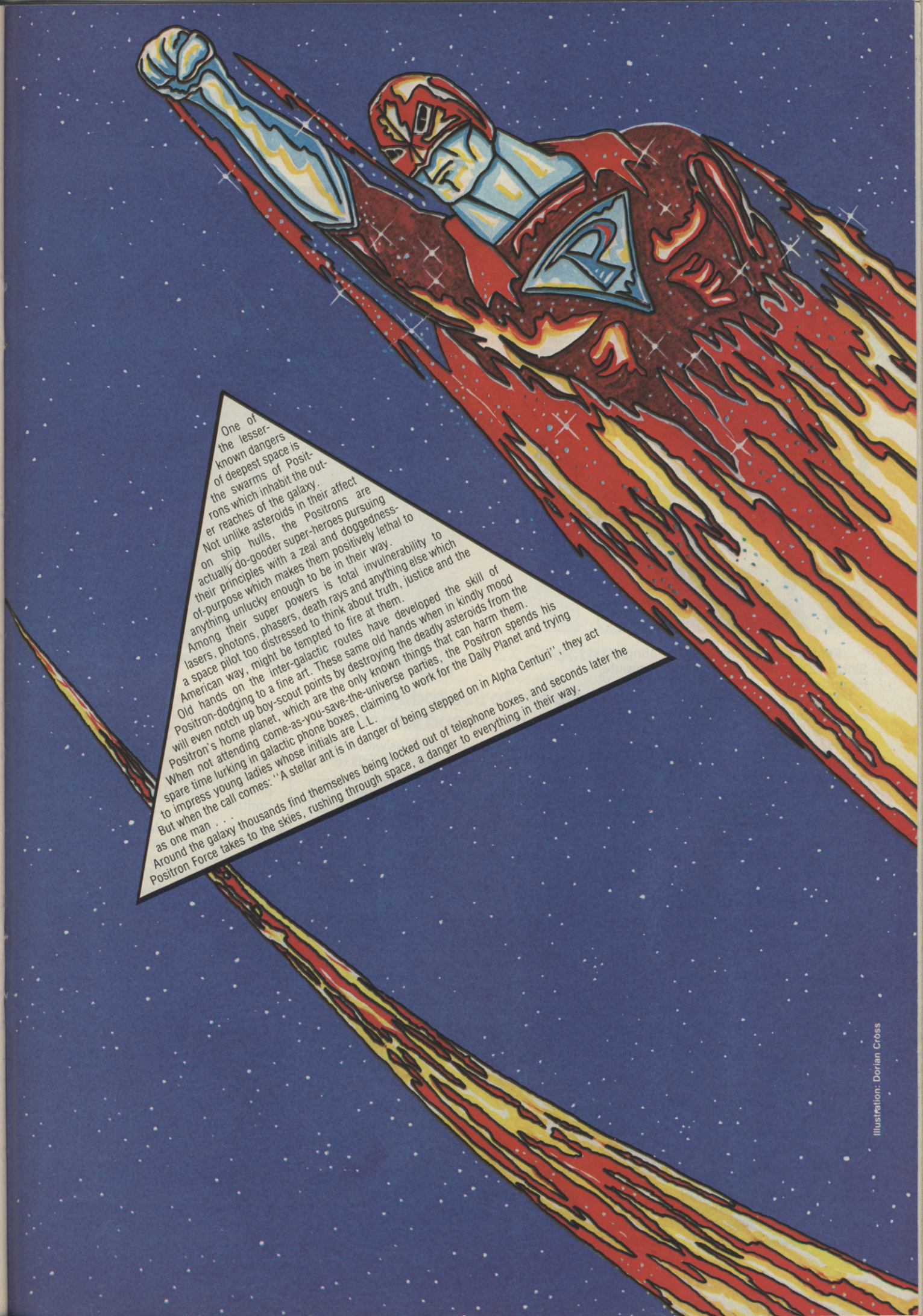

Illustration: Dorian Cross

Sinclair ZX Spectru

16K or 48K RAM... full-size moving-key keyboard... colour and sound... high-resolution graphics...

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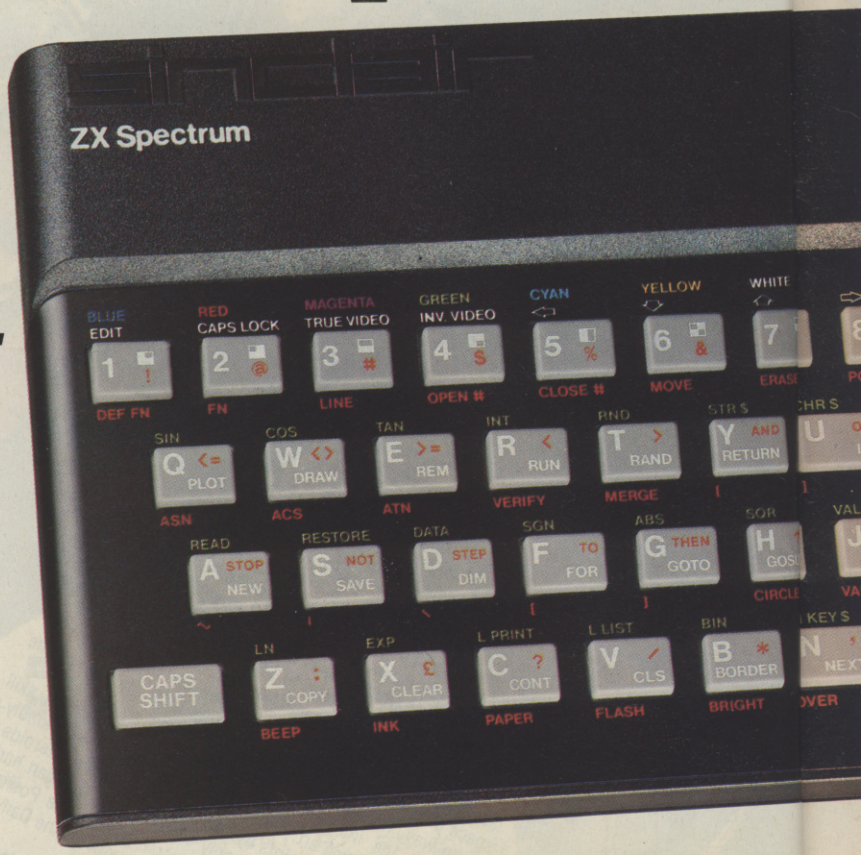


First, there was the world-beating Sinclair ZX80. The first personal computer for under £100.

Then, the ZX81. With up to 16K RAM available, and the ZX Printer. Giving more power and more flexibility. Together, they've sold over 500,000 so far, to make Sinclair world leaders in personal computing. And the ZX81 remains the ideal low-cost introduction to computing.

Now there's the ZX Spectrum! With up to 48K of RAM. A full-size moving-key keyboard. Vivid colour and sound. High-resolution graphics. And a low price that's unrivalled.

Professional power– personal computer price!

The ZX Spectrum incorporates all the proven features of the ZX81. But its new 16K BASIC ROM dramatically increases your computing power.

You have access to a range of 8 colours for foreground, background and border, together with a sound generator and high-resolution graphics.

You have the facility to support separate data files.

You have a choice of storage capacities (governed by the amount of RAM). 16K of RAM (which you can uprate later to 48K of RAM) or a massive 48K of RAM.

Yet the price of the Spectrum 16K is an amazing £125! Even the popular 48K version costs only £175!

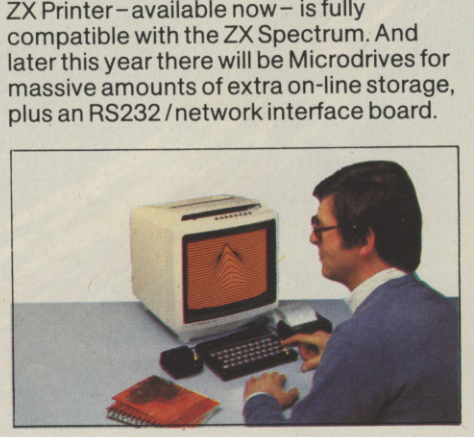
You may decide to begin with the 16K version. If so, you can still return it later for an upgrade. The cost? Around £60.

Ready to use today, easy to expand tomorrow

Your ZX Spectrum comes with a mains adaptor and all the necessary leads to connect to most cassette recorders and TVs (colour or black and white).

Employing Sinclair BASIC (now used in over 500,000 computers worldwide) the ZX Spectrum comes complete with two manuals which together represent a detailed course in BASIC programming. Whether you're a beginner or a competent programmer, you'll find them both of immense help. Depending on your computer experience, you'll quickly be moving into the colourful world of ZX Spectrum professional-level computing.

There's no need to stop there. The ZX Printer – available now – is fully compatible with the ZX Spectrum. And later this year there will be Microdrives for massive amounts of extra on-line storage, plus an RS232 / network interface board.



Key features of the Sinclair ZX Spectrum

- Full colour – 8 colours each for foreground, background and border, plus flashing and brightness-intensity control.
- Sound – BEEP command with variable pitch and duration.
- Massive RAM – 16K or 48K.
- Full-size moving-key keyboard – all keys at normal typewriter pitch, with repeat facility on each key.
- High-resolution – 256 dots horizontally x 192 vertically, each individually addressable for true high-resolution graphics.
- ASCII character set – with upper- and lower-case characters.
- Teletext-compatible – user software can generate 40 characters per line or other settings.
- High speed LOAD & SAVE – 16K in 100 seconds via cassette, with VERIFY & MERGE for programs and separate data files.
- Sinclair 16K extended BASIC – incorporating unique 'one-touch' keyword entry, syntax check, and report codes.

rum

The ZX Printer – available now

Designed exclusively for use with the Sinclair ZX range of computers, the printer offers ZX Spectrum owners the full ASCII character set – including lower-case characters and high-resolution graphics.

A special feature is COPY which prints out exactly what is on the whole TV screen without the need for further instructions. Printing speed is 50 characters per second, with 32 characters per line and 9 lines per vertical inch.

The ZX Printer connects to the rear of your ZX Spectrum. A roll of paper (65ft long and 4in wide) is supplied, along with full instructions. Further supplies of paper are available in packs of five rolls.

The ZX Microdrive – coming soon

The new Microdrives, designed especially for the ZX Spectrum, are set to change the face of personal computing by providing mass on-line storage.

Each Microdrive can hold up to 100K bytes using a single interchangeable storage medium.

The transfer rate is 16K bytes per second, with an average access time of 3.5 seconds. And you'll be able to connect up to 8 Microdrives to your Spectrum via the ZX Expansion Module.

A remarkable breakthrough at a remarkable price. The Microdrives will be available in the early part of 1983 for around £50.

How to order your ZX Spectrum

BY PHONE – Access, Barclaycard or Trustcard holders can call 01-200 0200 for personal attention 24 hours a day, every day. BY FREEPOST – use the no-stamp needed coupon below. You can pay by cheque, postal order, Barclaycard, Access or Trustcard.

EITHER WAY – please allow up to 28 days for delivery. And there's a 14-day money-back option, of course. We want you to be satisfied beyond doubt – and we have no doubt that you will be.

To: Sinclair Research, FREEPOST, Camberley, Surrey, GU15 3BR. **Order**

Qty	Item	Code	Item Price £	Total £
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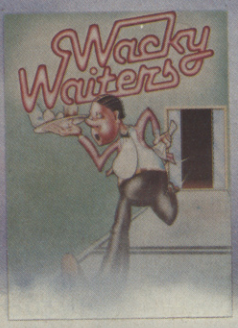

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GO GO GO

BY ALLAN SCARFF

In Go, unlike chess, material gains and losses are relatively unimportant when compared with other strategic matters.

Chess reflects the western style of warfare based on direct power and strength. Go is more subtle, resembling guerilla warfare as waged in Vietnam by the Vietcong who used Go in the military training of their officers.

While losing a group of stones may be disastrous, in some situations it can be positively beneficial. A good understanding of the status of each group on the board (or screen) is a prerequisite for making sound strategic decisions. So in this article we shall explore the basics of life and death.

Two or more eyes are alive

Consider the black group marked a in figure 1. Even though the outside intersections are occupied by white, white can never play at points A1 and A3 (these points are examples of eyes) because the rules of Go prohibit more than one move at a time and ban suicide.

The group marked b is more typical of a game situation. Although each eye is comprised of several intersections, allowing white to play inside them, the suicide rule will still prevent the capture of the black group.

One eye or less is dead

Consider the white group in figure 2. It has only one eye and cannot be given another because there is not enough space and the surrounding black group has two eyes and therefore cannot be killed. Note that black should not waste points by playing on the adjacent intersections (marked with x's), while his opponent makes gains elsewhere.

Critical groups

Consider the black group marked a in figure 3. If black gets to play at A2, the group will live but if white manages to play there first, the group is likely to die.

White can capture the group by continuing to play inside the eye (see the sequence given in figure 4).

If the surrounding white group can be attacked it may be a race to kill or be killed.

However, if white can make his surrounding group unconditionally alive he can remove the one-eyed black group at the end of the game.

It is slightly more difficult to judge the status of the group marked b. If white plays inside first, can black still make two eyes? The answer is no.

In fact this eye shape is known as the "hatchet five" and it is well known by most Go players that if white plays at the join of the handle to the axe head, the shape will eventually reduce to one eye. Of course if black plays there first he will be safe.

In contrast to the previous two groups, the group marked c, though not yet strictly alive, is almost impossible to kill. Black has two choices as to where to play to form a second eye so he can afford to wait until white has played on one before replying on the other.

When an eye is too big

Consider figure 5. White has enough space to form a one-eyed group of his own inside the black group. The black group is not therefore unconditionally alive but is quite safe because he would have to ignore no fewer than nine moves in order to lose his group.

However, the danger is greater the larger the eye space and the more white stones there are within it. To be absolutely safe the eye space must be a shape that cannot accommodate an opponent group with its own eye.

Counting the eyes

At least to start with, we need to radically simplify the problem to attempt a practical computer solution. One method can be outlined as follows:

- Detect the eye spaces bounded by black stones, ignoring white stones.
- Reject any space which is too big.
- Reject any space not bounded by a single group of connected stones.
- Count the eyes associated with each group.
- Repeat the process for the white stones, ignoring black stones.

Decisions decisions!

Having determined the status of each group — even if only approximately — a whole universe of decision making is opened up.

One simple but large improvement that can be made to our computer program is the suppression of needless moves capturing already dying stones within eyes. But by examining the status of neighbouring groups, quite sophisticated play can be devised.

For instance, a policy of attacking large one-eyed or eyeless groups can be implemented.

But there is no one golden strategy. The best Go programs balance and select between competing strategies. How such programs manage this is another story for another day!

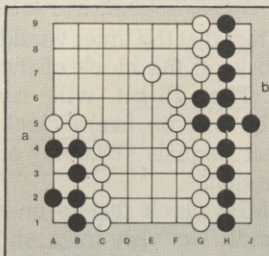


Fig 1. Unconditionally Alive

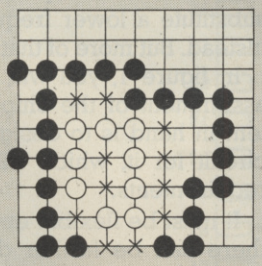


Fig 2. Unconditionally Dead

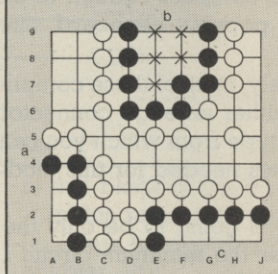


Fig 3. Indeterminate Status

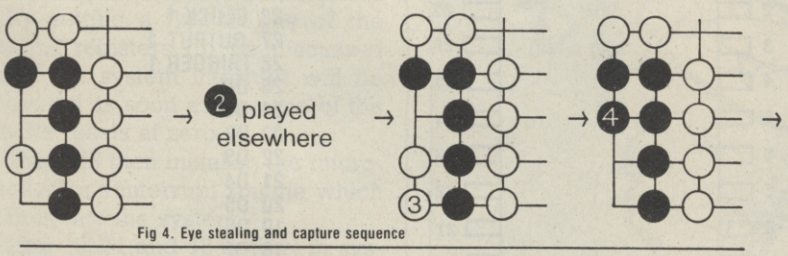


Fig 4. Eye stealing and capture sequence

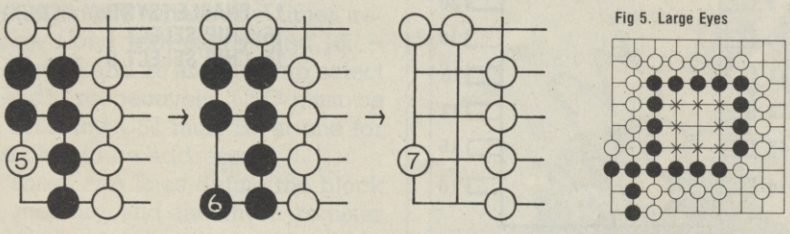


Fig 5. Large Eyes

Projects

MORE THAN A WORD CAN SAY

Welcome to the Projects page where I'll start on the development of projects which you have always wanted to build but have never really got around to.

As with Kit Korner, I will be describing the constructional aspects, paying special attention to the laying out of the circuit. Unlike it, I will be showing you how to use the circuit to full advantage.

There will be far more informative diagrams than in the past, primarily to reduce my volume of typing. After all a picture is worth a thousand words!

TAKING TIME . . .

To start off with I have chosen the Motorola 6840 programmable timer module around which to design a usable circuit.

We are all preoccupied with time. This design will go some way towards attaining the ideal from your computer.

The programmable timer module, (PTM), has three 16-bit binary counters which are addressed using a normal 8-bit data bus.

How come? I hear you cry. Well, quite simply you store two sets of 8-bits which the chip understands as one 16-bit set.

One of the difficulties to overcome is the fact that the timer would normally work off the clock of the computer. The 16-bit will be decreased by one on every clock cycle. 16-bit equals 64,000, or aroundabout that.

With a 1MHz clock that is only 64 milliseconds. Not very long, eh? To overcome that problem we just substitute a lower frequency clock instead. But more of that next month.

In figure 1, you will see the pin assignment of the chip. The problem in hand is to design a suitable circuit for it, which will serve our requirements.

It must be flexible enough so that there can be further development but also be compact enough to sit inside the popular keyboard size computers.

Fortunately, most of these computers have either an edge connector or another type from which you can take the lines needed for this module.

As there is going to be only the one chip for the minimum circuit I would probably use stripboard. Otherwise I would be tempted to wirewrap on a form of Eurocard and to use up the extra space with other periferals.

The chip requires a single 5-volt supply which is very convenient of them. The 8 data lines, 0-7, are there, of course, as well as two chip select lines.

The "enable" pin is, in fact, the system clock. Each timer has three separate registers; a decrementing clock, a start trigger, and an output line for indicating that the time has elasped.

There are three register lines with which to select the data and status registers. The last two lines are reset and interrupt request.

CHIPS AND PINS

In figure 2 I have drawn a brief outline of the chip and to what the pins must be connected. Pins 1 and 14 are obvious. The others may require a little explaining.

The data lines, though, interface directly with those on the main board.

Working in number order around the chip after the ground pin we come to the second timer lines.

Pin 2, the trigger line, or gate line sets counter 2 going as soon as the initialisation is complete.

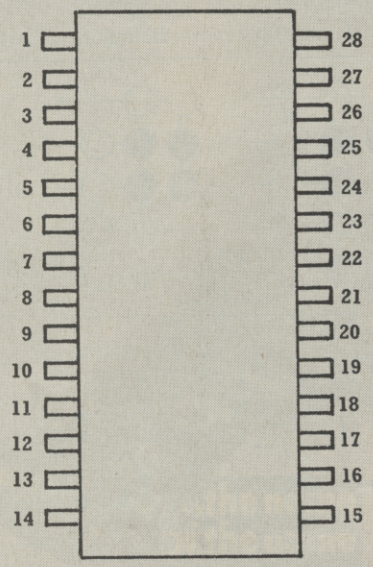
Pin 3, the output line, indicates when the period of timing is over and will drive 2 TTL loads.

Pin 4, the clock input for timer 2 defines the rate at which the binary number loaded into the timer is decremented.

This clock rate can vary up to the 'enable' clock which would normally be 1MHz. For most applications 1kHz would be sufficient and give a maximum count time of about 1 minute.

By using a simple 555 timer chip

Fig 1 Pin Assignment



Pin
1 GROUND
2 TRIGGER 2
3 OUTPUT 2
4 CLOCK 2
5 TRIGGER 3
6 OUTPUT 3
7 CLOCK 3
8 RESET
& INTERRUPT REQUEST
10 REGISTER SELECT 0
11 REGISTER SELECT 1
12 REGISTER SELECT 2
12 READ/WRITE
14 5 VOLT

Pin
28 CLOCK 1
27 OUTPUT 1
26 TRIGGER 1
25 D0
24 D1
23 D2
22 D3
21 D4
20 D5
19 D6
18 D7
17 ENABLE (SYSTEM CLOCK)
16 CHIP SELECT 1
15 CHIP SELECT 0

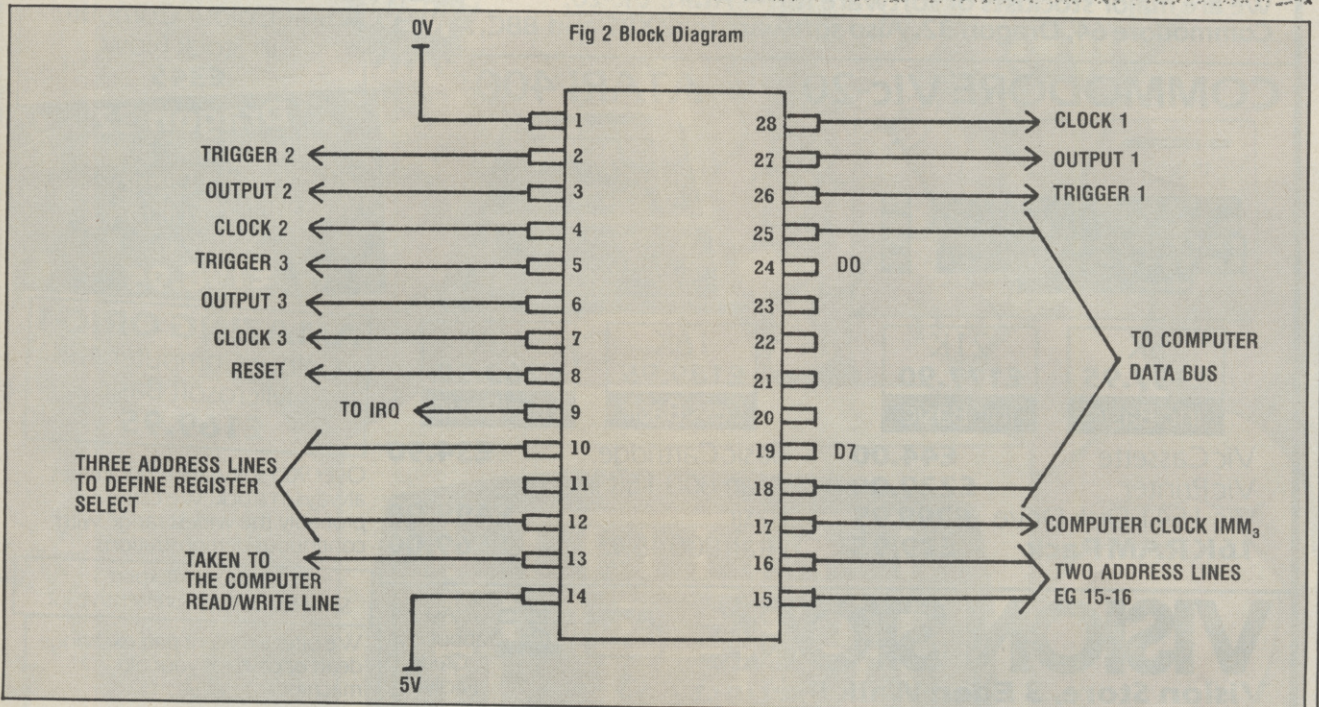


Fig 2 Block Diagram

or one of the new decimal divider chips almost any frequency can be defined.

Pins 5, 6, 7 and, likeways, 26, 27 and 28 I have explained in the last paragraph.

The reset line, pin 8, does exactly that. It will, whenever activated, reset the counters to their initial values, which are held in on-chip memory.

All that is then required is the triggers and the counters will start off, together, if required. The next pin, pin 9, houses the IRQ line, or interrupt request line.

OLD ROUTINE . . .

By setting a flag in one of the control registers (to be discussed later) the system interrupt will be activated as soon as any one of the clocks resets at zero.

This will then initialise the microprocessor's interrupt routine which is built into the system.

Pins 10, 11 and 12 define, in system memory where the timer resides, along with pins 15 and 16.

Pins 15 and 16 are the chip select 1 and 0 respectively. CSO must be at zero and CS1 must be at one for the chip to be addressed.

These two lines define the block in memory and the three register select lines define the location within that block of the 8 registers.

In this respect it works in a similar way to a periferal interface adapter, PIA.

The read/write line works in exactly the same way as it does in the rest of the system. For reference, the state of any of the registers may be read while the counter is in operation. This can be very helpful when setting up the counters for the first time.

As I have said before, the enable at pin 17 is the synchronous clock for reading and writing data to and from the counters.

It can, of course, be used for the timers' clock if very short periods are required from the counters.

If you are using a computer with a two phase clock this can be used directly with the counters.

Unfortunately, these days many processors only require a single phase so I will indicate how to derive the correct signal later.

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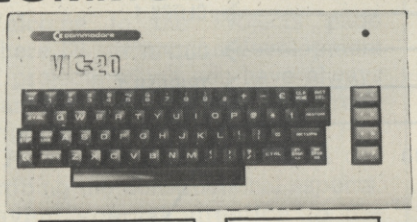

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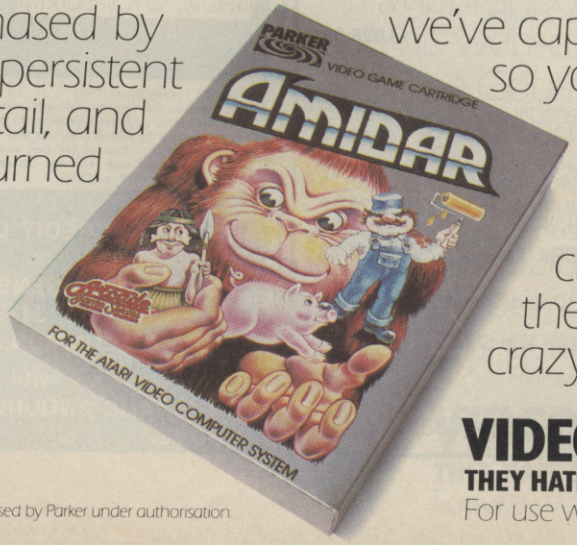

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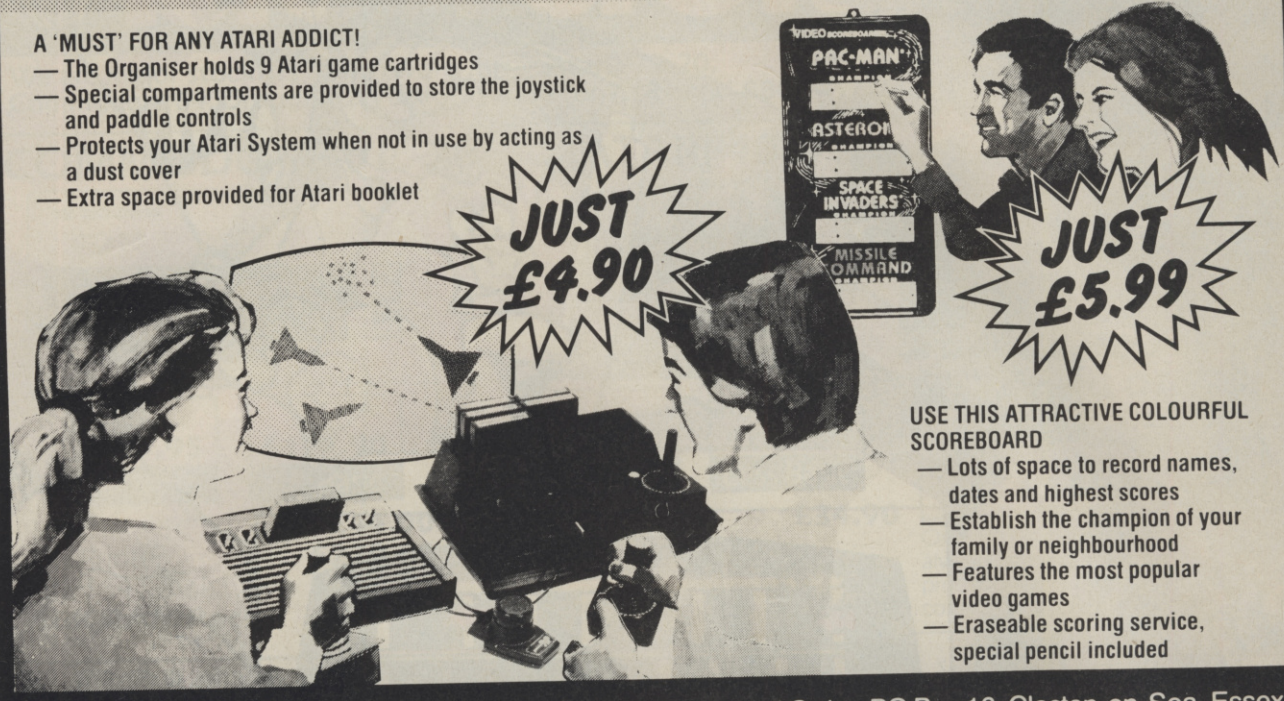

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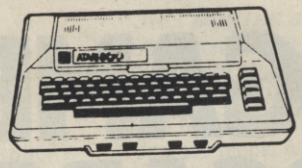

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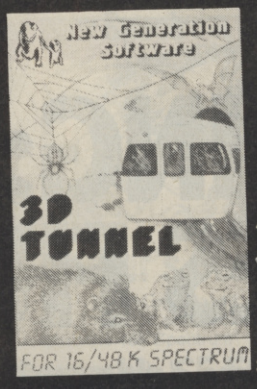

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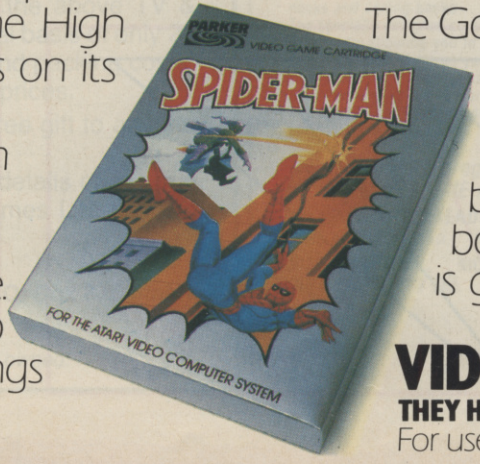

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Graphics

PLAY AROUND WITH PATTERNS

Experimenting with the rules for generating patterns of movement can produce many intriguing displays — and here I aim to set out some of those rules for you to play around with.

The pattern of movement of a point in a plane can be described by giving the position of the point at any time in terms of its initial position and the time.

If the initial position is given by the co-ordinates (XI, YI), and the current position by (XC, YC) then a typical way of giving the position at any time, T, is

XC =XI + T*YI
XC=YI

Note that the initial position corresponds to T=0, since this value for T gives

XC=XI
YC=YI

That is to say that at T=0 the current position is the same as the initial position.

The rules just given provide only one example of how the current position can be expressed in terms of the current time and the initial position.

Since we can describe the movement of a point in this way we can also deal with the pattern of movement of a flat object by examining how the points that are joined by its edges behave.

Next month we shall examine how solid, three-dimensional objects behave by applying the same idea to its corner points.

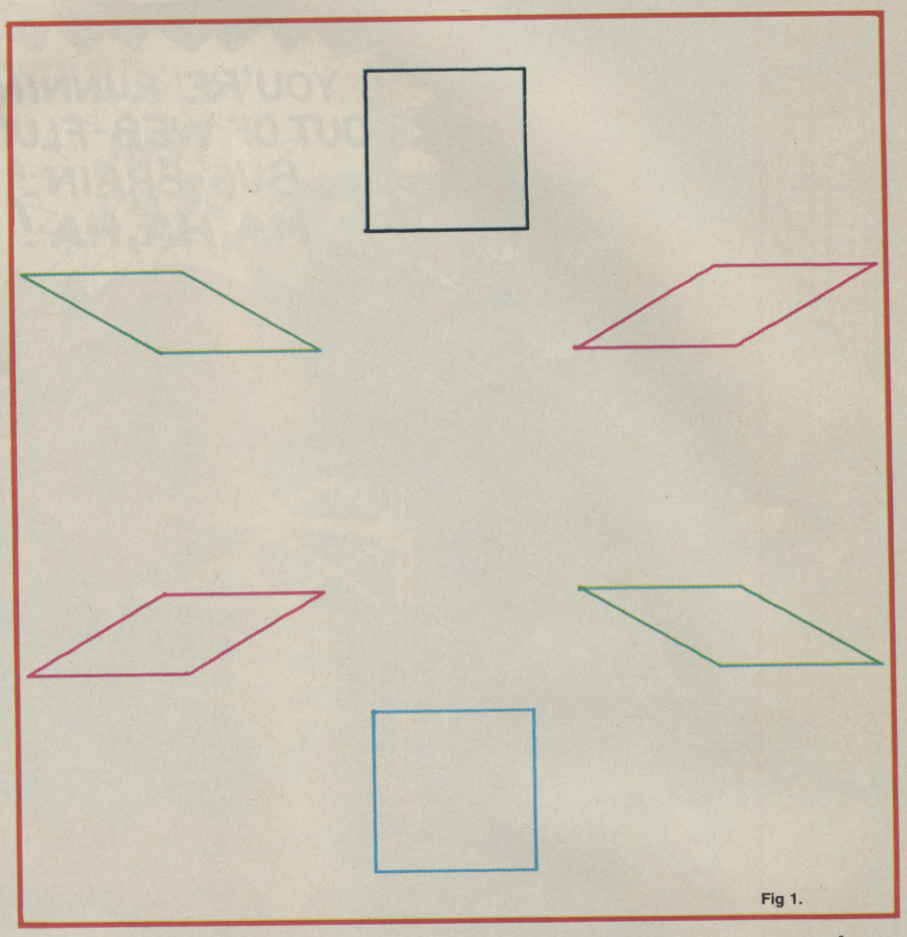

Fig 1.

If the way that the time is involved in the equations giving the patterns of movement is periodic, then the resulting pattern of movement will also be periodic.

In other words, the shape will return to its original position after a period of time. It will then repeat its previous cycle of movement again.

This is illustrated in figure 2, which was produced by using the rules

XC=XI + YI*SIN(T)
YC=YI*COS(T)

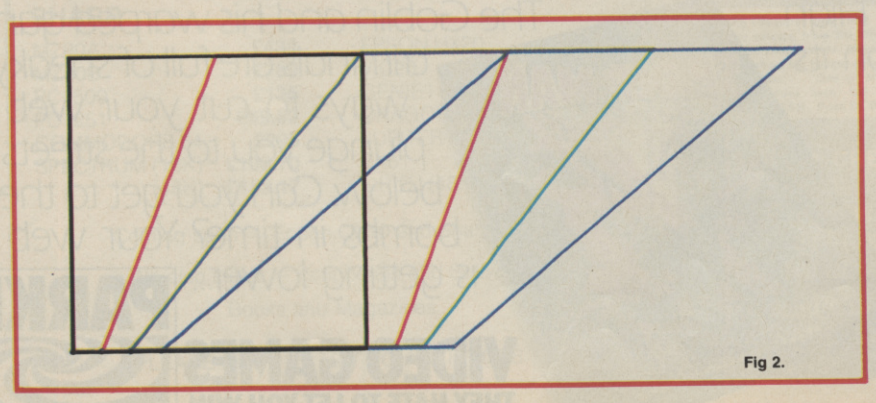

Fig 2.

The following program produces the initial shape of a square and three of its successive positions using the rules for movement given above.

```
 10 DIM XI (4), YI (4)
 20 FOR I=1 TO 4
 30 READ XI (I), YI(I)
 40 DATA 1, 1, 1, 5, 5, 5, 5, 1
 50 FOR I=1 TO 4
 60 T=0.1*(I-1)
 70 XX=XI (1) + T*YI(1)
 80 YY=YI(1)
 90 MOVE XX, YY
100 FOR J=2 TO 4
110 X=XI (J)+T*YI(J)
120 Y=YI(J)
130 DRAW X, Y
140 NEXT J
150 DRAW XX, YY
160 NEXT I
```

The resulting shapes are shown in figure 1.

By Gary Marshall

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(DESIGNER — JEFF MINTER)

J = JOYSTICK CONTROL

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ZX81

CENTIPEDE (16K)

the ORIGINAL game from the ORIGINAL author. This is the identical program to that being sold by other companies for three times our price. The game has received ecstatic reviews in the computing press. Program has 30 speed levels and ever increasing Centipede hordes. Tables top 10 scores and names. Why wait to pay more? **Only £1.95 + 50p P&P.**

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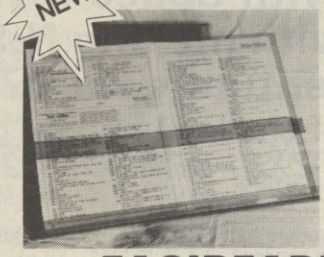

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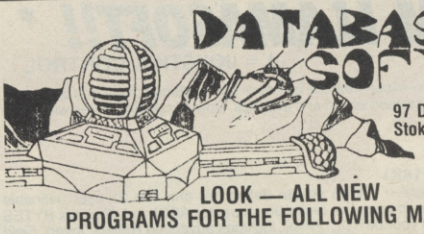

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BEWARE THE LOST NUMBERS

BY KEITH CAMPBELL

I have already explained how to avoid renumbering your Adventure programs beyond recognition.

However, when your game is complete it will be desirable to renumber it, as it will look more professional.

Adventures have a particularly high number of GOTO and GOSUB statements. It is almost impossible to prove that all of these point to lines that exist. The chances are that you will have forgotten to write one of them!

A side benefit of renumbering the program is that this will identify any Undefined Line errors without the need for exhaustive playing. The utility, when run, will list the lines that ought to be there but have gone missing.

Depending upon the Basic your machine runs, renumbering may also save some memory assuming you convert to smaller numbers.

This will not be achieved by the line numbers themselves being smaller, since these will always use 2 bytes each, however small.

The saving comes when the Basic holds GOTO and GOSUB numbers in ASCII form, thus using 1 byte for each digit.

Therefore, the smaller the numbers of the pointers, the less memory will be used.

Having decided, then, to renumber your program, when is the best time to do it? This will depend on what renumber facility you have.

Some machines, for example the BBC, have the feature built in, as will most disc operating systems.

On the other hand, machines like the TRS-80 require that a special program be pre-loaded before the Basic program which is to be renumbered.

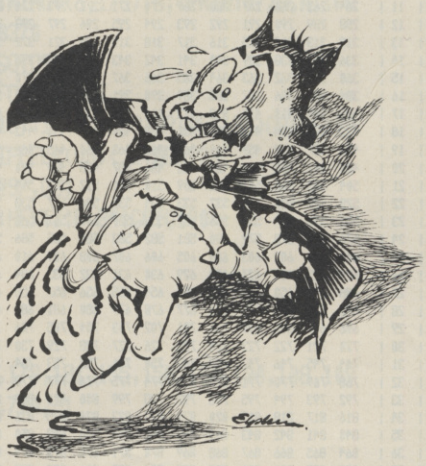
If your machine is this type, you will have to take into account the memory requirement for the utility, and ensure that your ever-growing Adventure is not too big before you renumber it!

If it is not quite finished, then perhaps it will be best to renumber in two's to leave space for insertions, otherwise renumber in one's.

If you are getting very short on memory, you might find that you can load both programs as long as you don't try to run the Basic program — the renumber utility will probably not take up much more room than the space the Adventure requires to run in.

Finally, if you have followed my convention for numbering REMarks, delete these before renumbering.

Apart from giving you the extra space you might need, the REMarks will have lost their identifying last digit of 9 after renumbering, and will be more difficult to locate.



We're falling in love again . . .

The other evening I found myself in a green bedroom wearing pyjamas and carrying a handbag.

Feeling somewhat weary I decided to have a short snooze, so I undressed and hopped into bed. Imagine my embarrassment when, stark naked, I suddenly awoke in a crowded room where a party was in progress!

All the guests turned and stared at me, and I froze to the spot. Regaining my senses, I returned with all haste to the bedroom, had a good wash, and feeling much better, put on the lovely silk dress I'd found in a trunk in the corner.

There was no doubt that I looked fantastic in it. Good, I thought, putting on some make-up, Tom should find me quite seductive.

Before you jump to any conclusions, let me explain that I was sitting in front of a computer, playing Love, an Adventure for women.

The action takes place in Poke Hall, and the object is to fall in love with a character called Tom. This Adventure runs on a ZX81 with 16K Rampack.

I played it in a mixed group with Barbara, Steve and Peter, who provided the computer. I soon got the impression I was already in love with Tom, as I found his cigarette lighter in my handbag.

Perhaps I ought to seduce him? Well, I obviously lacked a woman's intuition, because I couldn't even find Tom.

Meanwhile, Barbara was busily suggesting what clothes to wear and how to apply lipstick.

Steve and I were by now getting a trifle bored, and thinking up some fairly direct suggestions, which, being gentlemen, we refrained from mentioning in mixed company.

The game is certainly very suggestive, but Peter took the tape home to examine the listing and assured me that there were no naughty words in the program.

On the whole, Barbara felt that Love would be great fun played by a group of women. Personally, I would prefer to eavesdrop on those women than to actually play the game, but then it is advertised as an Adventure for women.

Strange, isn't it, that in these days of sexual equality, there are games especially for women, but not for men? Does this mean that all games not billed as 'for women' are suitable only for men?

Love is available from Remsoft of George Street, Brighton.

Welcome back to the Wild West where you'll experience excitement and adventure on the Warpath!

Here we continue to set out the rules for this thrilling conflict between Indians and the cavalry.

Once the Board has been prepared, you will be asked if you wish to review the Map. If you reply "Yes", the map will scroll across the screen until you press "ENTER".

Details of the numbers of each type of piece will appear at the top of the screen. The middle of the northern portion of the map will appear (the Troopers always move first) and play may commence.

The order of Play.

a) The Troopers and the General move first. The player may move all, some or none of the men.

b) All conflicts resulting from that movement are resolved.

c) The Indians now repeat steps (a) and (b).

d) These steps continue throughout the game until one of the winning conditions is met. This may occur during either the movement or the combat phase.

WARPATH

Part three of Ron Potkin's wild west wargame series tells you how to set up the board. Although it is designed for a TRS-80, we hope there is sufficient detail to help you succeed in adding Warpath to your collection.

AS promised, we will now discuss two important arrays: PTABLE and TBOARD. Once we have completed these, we can prepare the map and set-up the pieces ready for play to start.

PTABLE is an array of 50 by 3 and is dimensioned in line 780 as P(50,2). It contains information on each man i.e.

Index 0: The position on the Board.

Index 1: Type of piece — trooper, bowman etc.

Index 2: Attack flag.

Index 0 will be set to zero when the man is eliminated. If a piece is in a temporary HOLD condition, it is negated.

INBOARD is shown in figure 1. It is an array of 39 rows and 24 columns and is a representation of the map surrounded by a 4-byte border.

This requires 936 "cells" and, if dimensioned in integer format, would need at least 1872 bytes (more if your computer does not have the DEFINI instruction).

This wastes memory since no cell will hold a number greater than 255. Instead, I have reserved an area of 936 bytes starting at location 31669 (see line 1100). Since it is not a dimensioned array the only way I can access it is by PEEK and POKE.

When first initialised the centre is filled with 128's and the border with 99's. Each byte whose equivalent position on the map is occupied by a peice is given the value of the index of that piece (i.e. from 1 to 50). Those occupied by the garrison or boulders are given the value of 60.

The border is a useful feature. In the original KRIEGSPIEL, I carried out the calculations necessary to ensure that a piece was not attempting to move off the map, but this added to the time required to make a move.

With a border, one need only check if the piece is stepping on to a 99, If he is then the move is illegal.

Now we need another algorithm which relates IBOARD to BIGSCREEN. Given BL, the location of the piece on IBOARD, it returns ML, the location on BIGSCREEN. This subroutine is in line 320. It also returns V3 which is the location of the piece in memory.

I think you will be able to see that since IBOARD is 24 columns wide and the first location is at 100, the variable Q is the row number. If you look at BIGSCREEN, you will see that odd numbered rows are offset by 4; hence the need for "Q and 1".

Provided the argument is less than 32768, this faster and neater than "Q-2xINT (Q / 2)". If X, the divisor, is a power of 2 the remainder can always be obtained by NUMBER AND (X - 1).

Now that all four arrays are defined, we can review how they all fit togehter:

- The whole game is controlled by PTABLE which we run through sequentially; troopers first followed by the Indians.
- Read index 0 from PTABLE and obtain the location of that piece on IBOARD. If the location is zero, the piece has been eliminated — go to the next piece.
- Obtain the type of piece from index 1, get the correct character from the H table and calculate the number of moves for the piece (variable MV).
- Use BL to calculate ML from line 320. The machine language routine in X$(1) is now used to calculate the rectangle to be selected from BIGSCREEN.
- Display the rectangle and prompt the player for his move. We do this by alternately printing both the character and the number of moves at the position SP so that the piece flickers.
- Assume the player wants to move the piece and presses a number key. The hex he wants to move to (variable NX) is calculated and a check is made

LAYOUT OF THE INTERNAL BOARD

Game is played in the area bounded by the four corners 100,115,820 & 835
It is initially filled with 128's
The outer margin is filled with 99's

0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
2	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
3	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
4	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
5	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
6	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167
7	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
8	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215
9	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
10	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263
11	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287
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24	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599
25	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623
26	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647
27	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671
28	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695
29	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719
30	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743
31	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767
32	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791
33	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815
34	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839
35	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863
36	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887
37	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911
38	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935

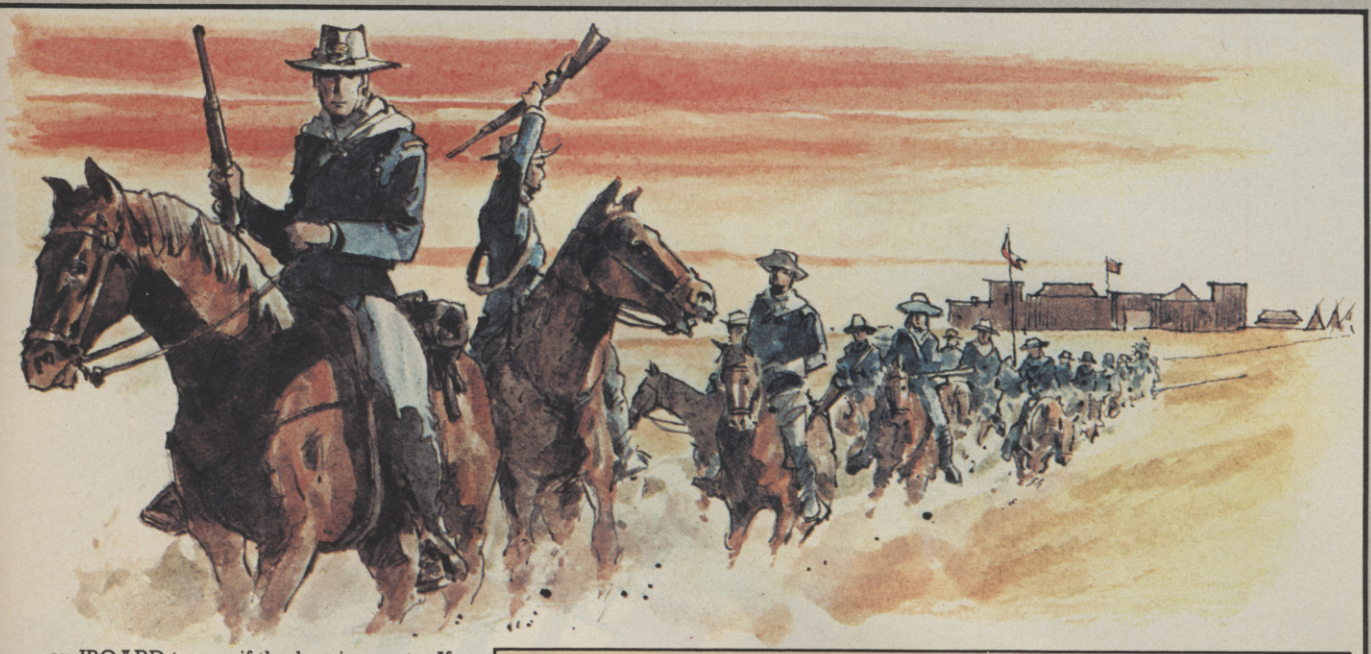

Illustration: Jon Davis

on IBOARD to see if the hex is empty. If it is not, the program returns to the prompt.

● If the move is legal several things happen:

a) Print a CHR$(128) — a space — on the screen at the old location.

b) Print the character at the new location.

c) Put 128 into position V3 on the IBOARD.

d) Put the piece index into NX.

e) Put the new location NX into index 0 in PTABLE.

f) Transfer WINDOW back to BIGSCREEN.

The listing this month will put the men, boulders and garrison on the map. As usual, load the Basic program containing both BIGSCREEN and PIECES from the last two months. Type in the listing below. We can now delete lines 821 and 2499 to 2610 — we no longer need the DEMONSTRATION DRIVER.

Save the program before you run it. By the way: I hope you are keeping the "UNRUN" versions. If you have only saved the RUN versions, the program will still work but you will have to avoid editing the lines from 1540 to 1560.

When you are asked for the scenario number, enter any number up to 9999. Type a number up to about 30 when asked to enter the number of boulders.

Next month, we are going to describe the SEARCH routine which will give you the chance to study some more Z80 machine language.

● If you are having difficulties entering Warpath into your type of computer please write in and let us know. We'll be interested to find out what your problems are and help tailor the write-up to offer advice on any computer which seems to be giving particularly difficult commands to translate.

WARPATH

to be continued next month

WARPATH Part 3 — SET UP

```
130 SV(K)=SV(K)+1:PC(I,0)=BL:PC(I,1)=K:GOSUB380:PRINT@SP,H(K);:G
OSUB140:POKEV3,I:GOSUB370:I=I+1:RETURN
140 IFK<>5THENRETURNELSESF=BL:A1=CHR$(171):PRINT@SP+3,A1;:RETURN
320 Q=INT((BL-100)/24):ML=8*BL-800-64*Q+4*(QAND1):V3=BO+BL:RETUR
N
370 O=0:GOTO390
380 O=1:GOSUB320
400 O=0:GOTO420
410 O=1:GOSUB320
420 P=B1:GOSUB190:SP=USR(ML+O):P=B4:GOSUB190:RETURN
540 RETURN      'STUB
830 CLS:INPUT"REVIEW MAP";A:IFLEFT$(A,1)="Y"THENGOSUB850
840 GOSUB540:GOTO840
850 CLS:FORI=220TO700STEP96:FORJ=0TO15:BL=I+J:GOSUB410:IFINKEY$<
>""THENRETURNELSENEXT:NEXT:GOTO850
860 P=B1:GOSUB190:K=1:I=1:R3=2
870 READJ:IFJ>0THENFORJL=JTOJ+504STEP72:GOSUB260:BL=JL-1+WN:GOSU
B130:NEXT:K=K+1:GOTO870ELSEI=26:K=4
880 READBL:IFBL>0THENGOSUB130:GOTO880ELSEIFBL=-1THENK=K+1:GOTO88
0
890 BL=797:GOSUB380:FORJ=0TO2:PRINT@388+J*8,CHR$(128)+CHR$(188)+
CHR$(188);:POKEBD+676+J,60:NEXTJ:PRINT@452,GT;:A=CHR$(191):PRINT
@542,A;:PRINT@606,A;:PRINT@664,STRING$(6,176);A;:PRINT@728,A;:PR
INT@788,C5;A;:POKE822+BD,60:GOSUB370
900 READJ:IFJ>=0THENPOKEBD+J,60:GOTO900
910 IFMT<=0THENRETURNELSER3=495:FORI=1TOMT
920 GOSUB260:BL=100+WN+8*INT(WN/16):IF(BL=629)OR(BL=630)OR(BL>79
5)OR(BL=653)THEN920ELSEGOSUB320:IFPEEK(V3)<>ZTHEN920
930 O=1:GOSUB390:POKEV3,60:PRINT@SP,C3;
940 GOSUB370:GOSUB430:PRINTMT;I;:NEXTI:P=B4:GOTO190
1084 GOSUB5200
1085 RESTORE
1086 READM:IFM<>-128THEN1086
1190 DATA102,100,138,-1
1200 DATA206,203,205,204,178,182,179,181,155,158,130,134,108,109
,725,726,749,748,750,773,774,772,724,-1
1210 DATA132,-2
1220 DATA700,702,727,775,798,-1
```

Make Friday your

Friday, March 11th sees the launch of Britain's most exciting microcomputing publication. Big deal.

You've heard all that before, eh? Over the last year, everybody and the cat's mother have been launching microcomputer publications.

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ur day of discovery.

the March issues of those monthlies brave enough to carry it. Get the point?)

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PUZZLING

A MIX-UP IS ON THE CARDS

Each of five boys wrote one of the words SURLY, THUMB, UNDER, VIXEN, WHACK on a card. Then each took a card one of the others had written.

Bob wrote the word taken by Charlie; Al took the word written by the boy who took the word SURLY; Dan wrote the word taken by the boy who wrote the word VIXEN; Ed wrote the word taken by the boy who wrote the word taken by Ed himself.

In no case did the word a boy wrote and the word he took begin with consecutive letters.

Now, if you've managed to follow all that, breathe in, don't panic, count to 10 and tell us the word written by Bob and the word on the card taken by Dan.

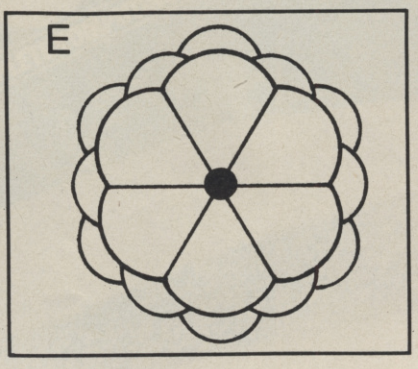
Paul McClenon

A BLOOMING PROBLEM

Farmer Nure has spent the last four years developing his unique plant, *rosa patriotica,* for show.

Nature, after following a strictly logical path in selecting each petal's colour in successive blooms, then threw in an unseasonal frost and killed the fifth generation before it blossomed (see [E] below).

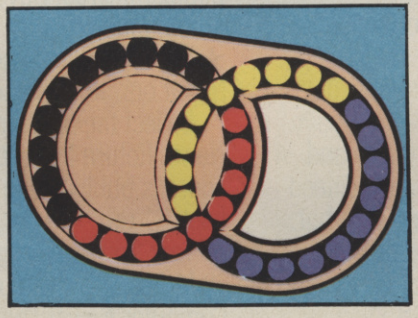
Can you work out how it would have been coloured?

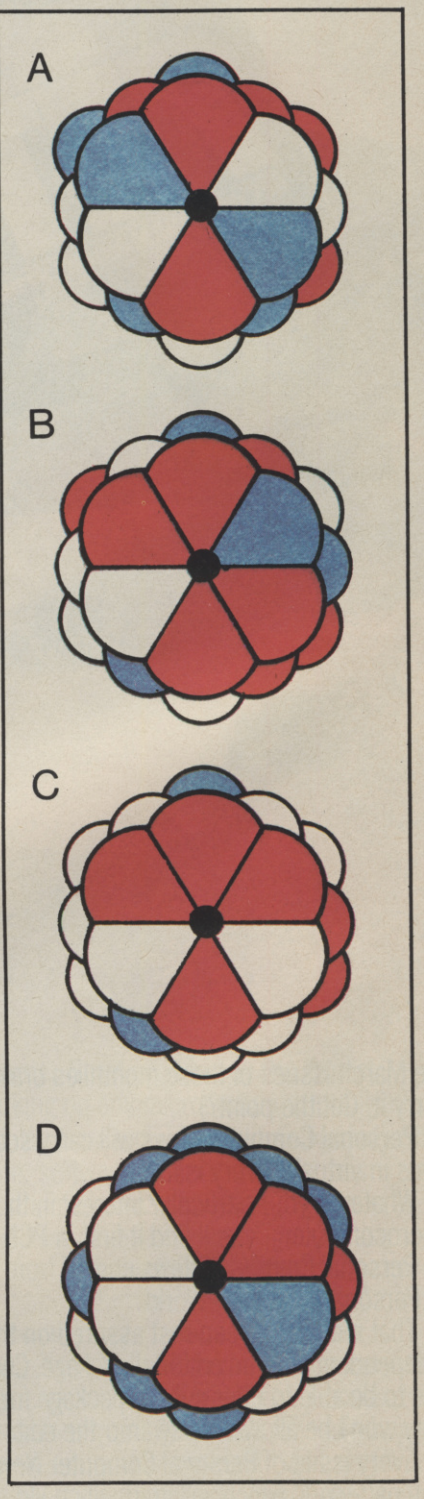


We are giving away 10 Hungarian Rings to 10 Puzzling fanatics who can solve Farmer Nure's blooming problem before March 12th.

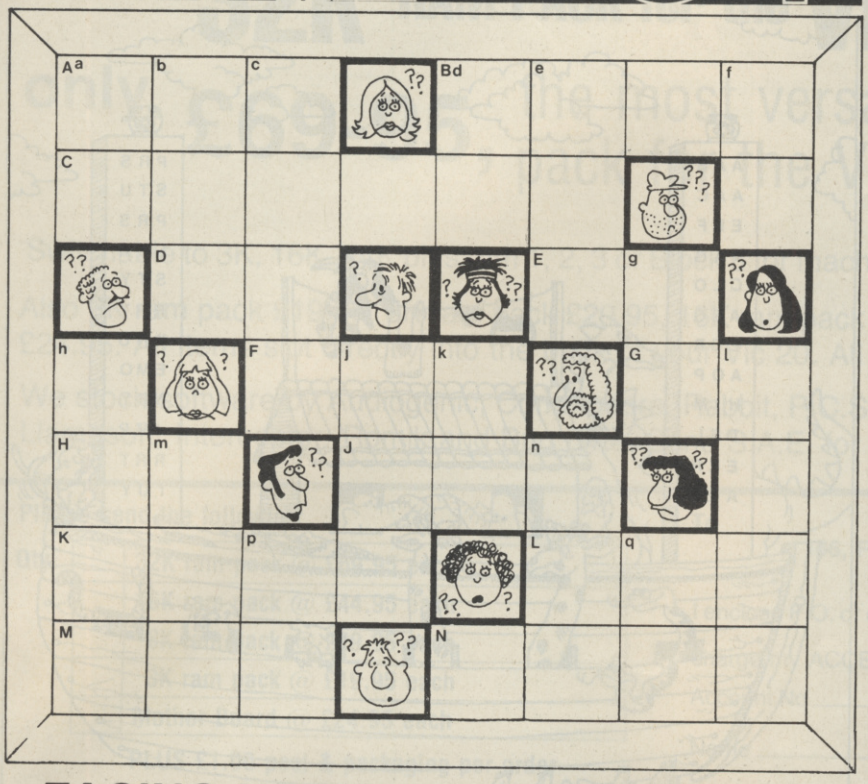
Vulcan Electronics have put forward 10 of their brain-teasing ring puzzles (pictured below) for the first 10 solutions out of the hat. Once jumbled up they may never be solved again.

Just colour in the "E" bloom above and send it to: A Blooming Problem, Computer & Video Games, 8 Herbal Hill, London EC1R 5JB.





PUZZLING



FACING UP TO A CROSSNUMBER

Just in case this is new to any of you present here today — the puzzle is similar to the crossword in that one digit is entered in each square instead of one letter and numbers are formed Across and Down instead of words.

The main differences are that in crossnumbers the clues can be much more inter-related and initially perplexing (B across — see g down; g down — see B across!) and, in this particular version, some of the clues are so deliberately vague as to require a calculator or short computer program to search for the one answer among several possibilities.

So, with one hand on the keyboard and t'other round the pencil, here we go . . .

Clues: Capital letter refer to Across clues, lower case to Down clues.

ACROSS

A) The square of the last 2 digits of C.
B) Prime cubed — the digits sum to the original prime.
C) Prime cubed — all its digits are odd.
D) Ↄ !!
E) Factor of e.
F) Fibonacci number which has consecutive digits.
G) Multiple of 7.
H) Digits add up to 16.
J) F — twice a.
K) Sum of the multiples of 3 between 100 and 200.
L) All digits are even — they sum to 20.
M) First 2 digits add up to the third.
N) Cube — sum of the digits is a cube.

DOWN

a) Prime — see h.
b) Difference between the sum of the first ten squares and the first 10 primes (no, 1 is not a prime).
c) All odd digits which sum to 18.
d) Reversed, would be twice the square root of g.
e) See E.
f) See q.
g) See q.
h) Sum of several consecutive multiples of a, starting from 507.
j) Difference between the first 2 digits is one more than the last digit.
k) Multiple of G reversed.
l) Square — split in half gives two more squares.
m) Cube squared plus a square cubed.
n) Sum of the first 10 Fibonacci Numbers (1,1,2,3,5, . . .).
p) Another Fibonacci Number.
q) f+g.

The solutions to the Puzzling brain-teasers can be found on page 11.

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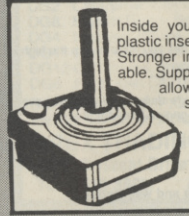

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PUZZLING

NOAH'S MUDDLED MENAGERIE

Just how Noah managed to land the Ark on Ararat is glossed over in all the literature. It can now be placed on record that he landed with a bump like that of a hanglider whose wing has prematurely folded.

The result was to turn his *menagerie* into a *macedoine* — his ZOO became, literally, an OOZ.

Twelve of the six-letter specimens had their letters re-arranged into alphabetical order and split in half. The two lists were then sploshed around in rather random fashion.

Before Noah could lower the gangplank he had to match the correct parts and so order the letters that our familiar names re-appear, otherwise the world would be stuck with a HHRSTU instead of a THRUSH!

The whole of creation was at stake and if he didn't sort things out right now, the evolutionists would have a field day in the future.

So he set to and did his best to give the world back a batch of animals it might be able to pronounce.

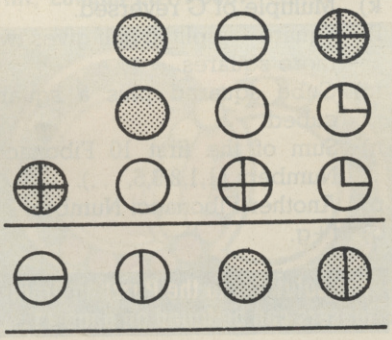
Can you give him a hand and tell him which 12 animals can be unloaded.

BY TREVOR TRURAN

DIFFERENT DIGIT CODE

Each different symbol represents a different digit. And you can assume the obvious ◯ is 0 and ◐ is 1.

Can you work out the value of the others to complete an addition sum?



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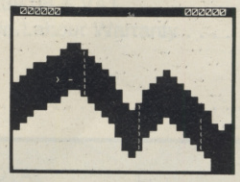

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This form will merely help us to keep a check on your game as it goes through our testing process and make sure we have all the information we need to present it properly in the magazine.

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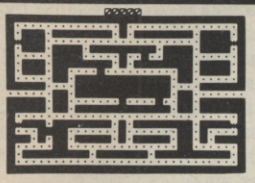

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MACHINE CODE

DECISION MAKING AND THE MICRO

The real power of computers comes from the way they can make decisions and perform different actions according to different values of the input data.

We will now start to look at the "decision making" instructions in assembly language.

In Basic we have instructions of the form "IF condition THEN GOTO line number", where the condition may be a complicated expression involving arithmetic, logical and comparison operators.

In assembly language, however, the only conditions we can use directly involve the sign, zero, carry and overflow flags.

The first type of conditional jump we are going to look at is the Branch or Relative Jump, and the instructions available on the 6502, 6809 and Z80 are listed in tables 1, 2 and 3.

The only conditional jumps on the 6502 are the eight branch instructions shown in table 1, but the 6809 and Z80 have others which we will deal with later.

In Basic we have to use line numbers to refer to the program instructions. In assembly language we use labels instead of line numbers.

The editing programs in some assemblers use line numbers but this is purely to keep the lines in the right order and it is impossible to refer to the line numbers in the assembly language program.

The standards for 6502, 6809 and Z80 assembly languages specify that labels may be up to six characters long, the first character must be alphabetic, and any subsequent characters may be alphabetic or numeric.

Thus, START, FINISH, L99, A2B3, are valid labels but ?START, 9L, are invalid.

Also, register names, opcode mnemonics and other reserved words are usually not allowed as labels, but even when your assembler allows reserved words to be used as labels it is not good practice to use them.

Some Z80 assemblers require that a label must be followed by a colon. In this case it may be possible to use a reserved word as a label because the colon permits the assembler to distinguish between.

For example, ADD: used as a label and ADD used as an opcode mnemonic.

To see how we use labels with the branch or relative jump instructions, let us look at simple counting loops in the three assembly languages.

table 1

	Hex Object Code	Label	Instruction
6502			
	A2 OA	START	LDX #10
	CA	LOOP	DEX
	DO FD		BNE LOOP
6809			
	86 10	START	LDA #10
	4A	LOOP	DECA
	26 FD		BNE LOOP
Z80			
	06 10	START	LD B,10
	05	LOOP	DEC B
	20 FD		JR NZ, LOOP

We start by setting a register to the initial value of the count, then decrement the counter register. If the register is not zero we jump back to the decrement instruction labelled LOOP.

When the counter register becomes zero, after 10 steps, the program will continue with the next instruction.

The branch or relative jump instruction introduces a new addressing mode, *relative addressing*.

The second byte of the object code is a displacement specifying how many bytes to jump; regardless of the absolute address of the instruction the jump will be to the address a specified number of bytes away.

The displacement is a signed binary number, with values from 0 to 7F hex (o to 127 decimal) representing a forward jump and values from 80 to FF hex (128 to 255 decimal) representing a backward jump.

The absolute address, which is the destination of the relative jump, is calculated by taking the absolute address of the byte immediately following the relative jump instruction and adding the displacement, making allowance for the sign.

In the examples above, if the first line began at address 1000 hex the second line would begin at 1002 hex, the third line would begin at 1003 hex and the address of the byte following the relative jump instruction would be 1005 hex.

The value of FD hex for the displacement, interpreted as a signed number, is equivalent to −3, so the destination address is 1005 + (−3), or 1002.

To illustrate a forward relative jump consider the following examples:

	Address	Hex Object Code	Label	Instruction
6502	1050	90 2E		BCC DEST
	1052	. . .		. . .
	. . .	. . .		. . .
	1080	. . .	DEST	. . .
6809				
	1050	24 2E		BCC DEST
	1052	. . .		. . .
	. . .	. . .		. . .
	1080	. . .	DEST	. . .
Z80				
	1050	30 2E		JR NC,DEST
	1052	. . .		. . .
	. . .	. . .		. . .
	1080	. . .		. . .

The destination, 1080hex, is calculated by adding the displacement, 2E hex, to the address of the byte following the relative jump instruction, 1052 hex, or conversely the displacement is calculated by subtracting 1052 hex from 1080 hex.

WITH A HOP, A SKIP AND JUMP!

As well as these relative jumps we have absolute jumps, where the destination address is included in the instruction.

The Z80 instruction set includes conditional absolute jumps, which are shown in table 4. On the 6502 and 6809 relative addressing is used for all con-

BY TED BALL

ditional jumps, and in other addressing modes we have only the unconditional jump, with opcode mnemonic JMP.

In assembly language we can write a label or a numeric value for the destination address, for example:

```
6502 & 6809
        JMP $1000
        JMP START
Z80
        JP 1000H
        JP NZ,START
```

The object code format for the unconditional jump instructions is one byte for the opcode followed by two bytes for the operand.

The operand appears in the usual format for a two byte operand, with the low byte first and the high byte second on the 6502 and Z80, and with the high byte first and the low byte second on the 6809. Thus we would have:

	Hex Object Code	Source Code
6502	4C 00 10	JMP $1000
Z80	C3 00 10	JP 1000H
6809	BD 10 00	JMP $1000

FLAGS SIGNAL THE MESSAGE

In order to use the conditional jumps we need to know how the other instructions affect the flags. It is not difficult to learn which flags are affected by various classes of instruction, but you will need to look this up in a reference manual at first.

In most cases we only need to bother with the sign, zero and carry flags and it is usually quite easy to work out how these flags are affected by most instructions.

However, there are complications when signed arithmetic is involved, and next month we will look more losely at the mechanics of signed binary arithmetic, paying special attention to the values of the carry and overflow flags in the various cases that can arise.

Table 1
6502 Branch Instructions

Hex Code	Instruction	Meaning
10	BPL label	Branch if plus (positive)
30	BMI label	Branch if minus (negative)
50	BVC label	Branch if Overflow clear
70	BVS label	Branch if Overflow set
90	BCC label	Branch if Carry clear
BO	BCS label	Branch if Carry set
DO	BNE label	Branch if Not equal (Not Zero)
FO	BEQ label	Branch if Equal (Zero)

Table 2
6809 Branch Instructions

Hex Code	Instruction	Meaning
20	BRA label	Branch always
21	BRN label	Branch never
22	BHI label	Branch if higher (greater)
23	BLS label	Branch if lower or same
24*	BCC label	Branch if Carry clear
24*	BHS label	Branch if higher or same
25*	BCS label	Branch if Carry set
25*	BLO label	Branch if lower
26	BNE label	Branch if Not Equal (Not Zero)
27	BEQ label	Branch if Equal (Zero)
28	BVC label	Branch if Overflow clear
29	BVS label	Branch if Overflow set
2A	BPL label	Branch if Plus (positive)
2B	BMI label	Branch if Minus (negative)
2C	BGE label	Branch if Greater or Equal
2D	BLT label	Branch if Less Than Zero
2E	BGT label	Branch if Greater Than Zero
2F	BLE label	Branch if Less Than or Equal to Zero

*Note two different opcode mnemonics for the same object code.

Table 3
Z80 Relative Jumps

Hex Code	Instruction	Meaning
10	DJNZ label	Decrement B & Jump if Not Zero
18	JR label	Jump Relative
20	JR NZ, label	Jump Relative if Not Zero
28	JR Z, label	Jump Relative if Zero
30	JR NC, label	Jump Relative if No Carry
38	JR C, label	Jump Relative if Carry

Table 4
Z80 Absolute Jumps

Hex Code	Instruction	Meaning
C3	JP label	Jump
C2	JP NZ, label	Jump if Not Zero
CA	JP Z, label	Jump if Zero
D2	JP NC, label	Jump if No Carry
DA	JP C, label	Jump if Carry
E2	JP PO, label	Jump if Parity Odd/Overflow set
EA	JP PE, label	Jump if Parity Even/Overflow clear
F2	JP P, label	Jump if Sign Positive
FA	JP M, label	Jump if Sign Negative

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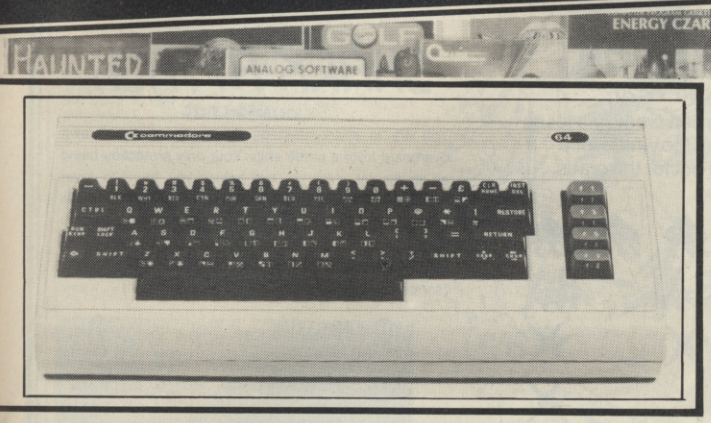

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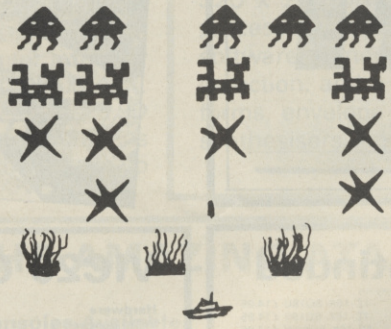

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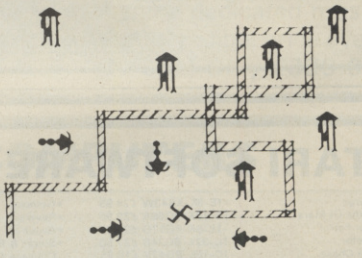
For unexpanded Vic20

You are in shark-infested waters after being thrown overboard from a pirate ship. Your only protection being an atomic net which you trail behind you, trying to cover all the visible ocean and ensnare the sharks at the same time. Beware of stopping or covering your tracks for too long, if you do, then the sharks will escape and come after you. Watch out for the ever increasing deadly octopi (somtimes the sharks will eat part or all of one!)



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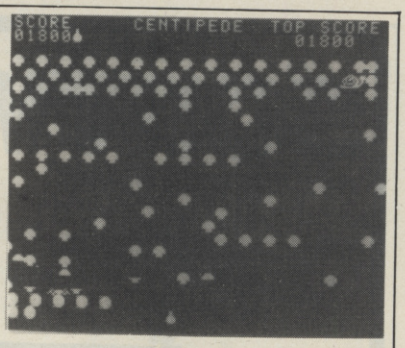

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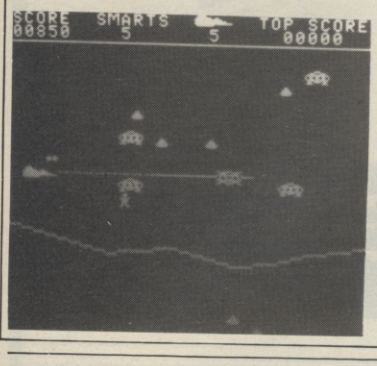

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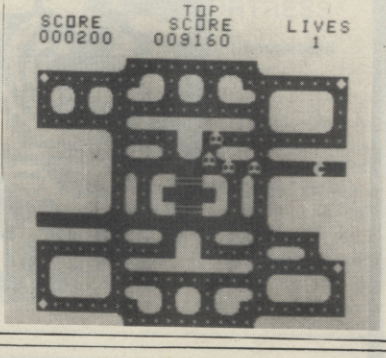

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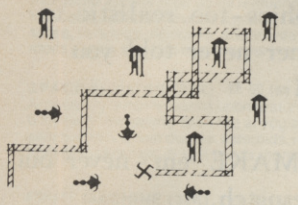

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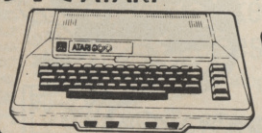

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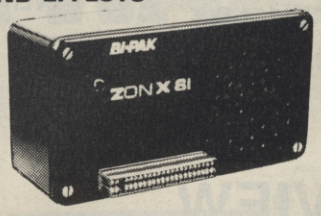

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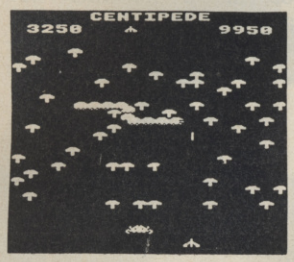

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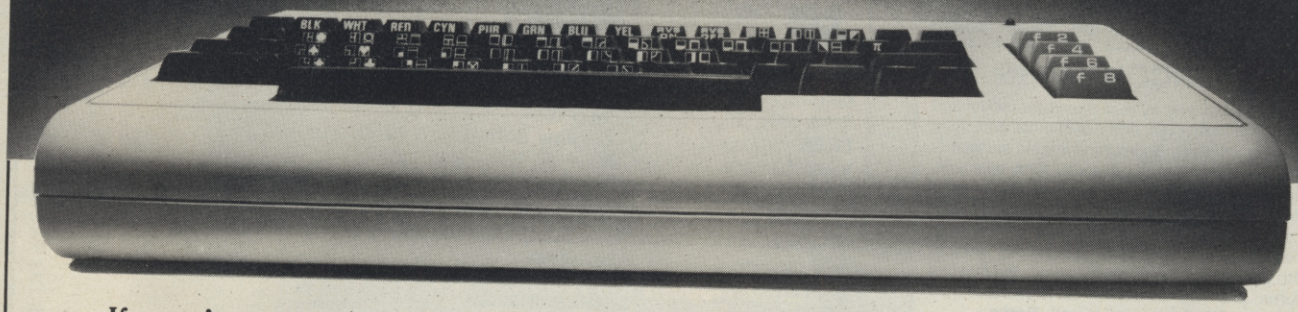

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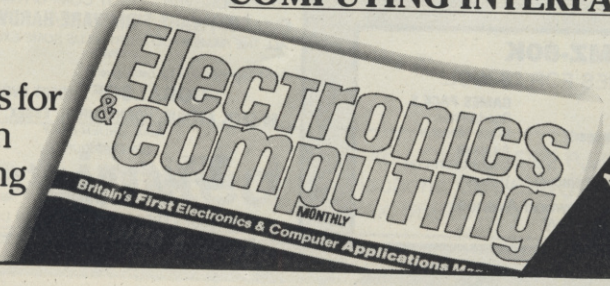

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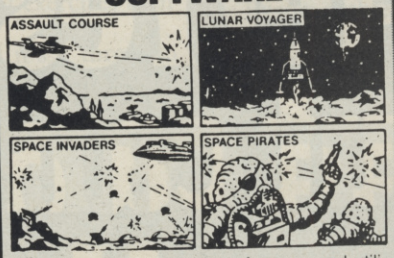

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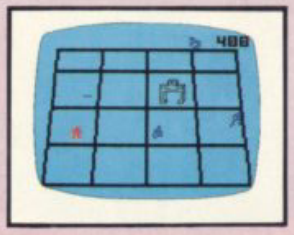

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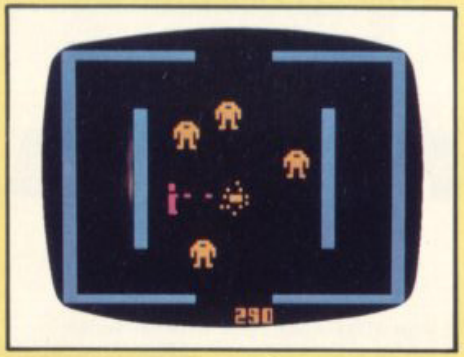

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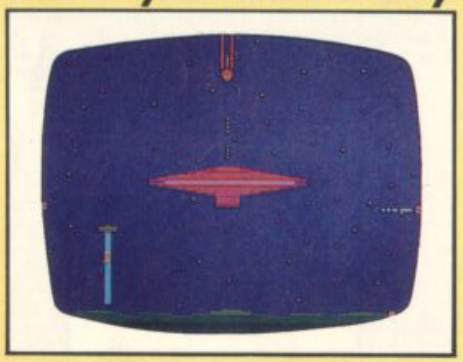

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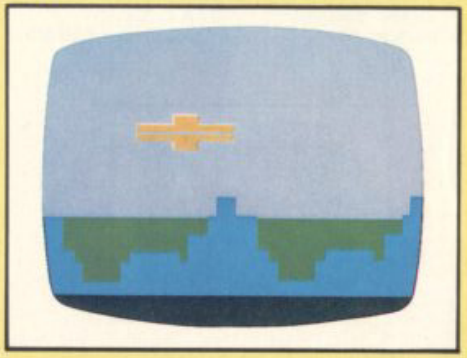

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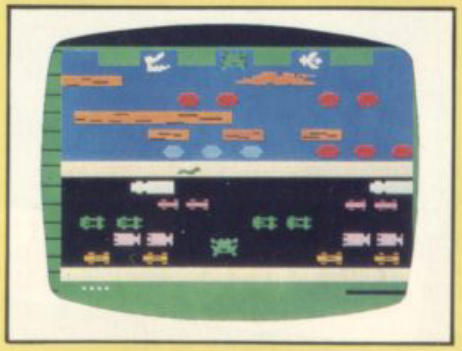

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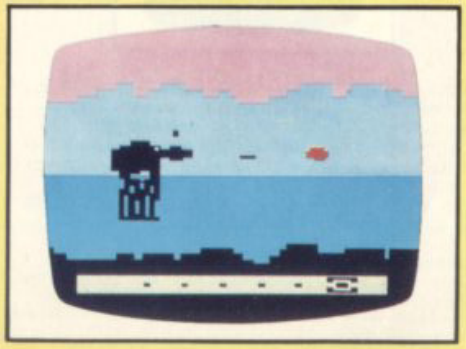

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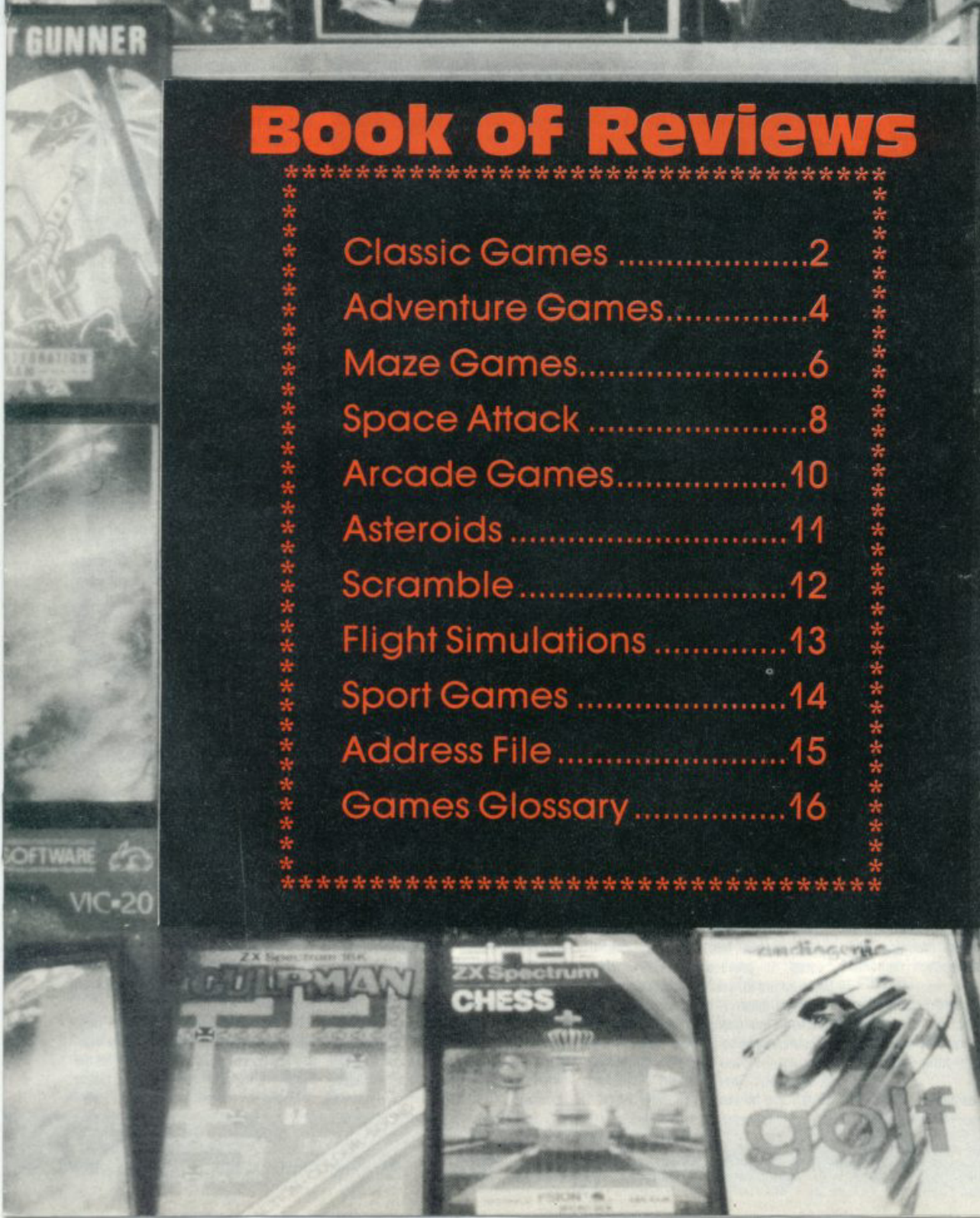


CLASSIC GAMES

SHARP

Computer & Video Games' very own contributor, John Ball, has come up with the goods on **Sharpsoft's** version of Othello.

Complete with loud bleeps, every time it makes a move, the machine plays a very good standard of Reversi and defeated all my attempts to force it into submission.

Even reading John's column on the subject and obeying his guidelines with regard to corner squares and understanding what the computer was up to didn't help.

It had a particularly frustrating habit of turning the tables on me at the end of a game just as I thought I had un unbeatable position.

The screen presentation is simple as Sharp graphics force it to be but simplicity suits Othello and it is a very playable game with a good response time. Only buy it if you can stand to be beaten. It costs **£6.90.**

- Getting started 7
- Value 8
- Playability 9

SPECTRUM

Reversi, or Othello as it is often called, is a nineteenth century game of territorial acquisition. Strategy and skill are needed to win.

Two versions of the game are currently available for the Sinclair Spectrum, and both run on the unexpanded machine. One is by **Mine of Information**, for Sinclair Research, and the other has been written by **Microx**, based at Worthing, Sussex.

The Sinclair version comes in a very pleasant package, the cassette insert is colourful and packed with information. Beginners should soon become well-versed in the game by simply reading it.

The program loaded without any problems and ran immediately. The game is fairly standard, but with many interesting features.

To begin with, there are nine skill levels, with a three-second response time at level 1.

You can challenge the computer, with either the Spectrum or yourself starting, or you may play against a friend with the computer acting as umpire.

If you are a beginner, you may review a sample game at your leisure. Half-way through a game you may change sides, and at the end of one, you may review all the moves of the game.

The graphics are fair, and there is even a facility to change border, paper and ink colours to your requirements. All in all, this is a most magnificent game.

I wish I could say the same for the Microx version. The purchaser is greeted by a most unappealing package bearing the company's name and the program title.

After sorting out the loading problems, which I have never had with any other cassettes, I was confronted with a page of confusing text which would leave the beginner completely bemused.

The game itself has a rather uninteresting screen display, and makes average use of colour.

When I tried the program on a monochrome television set, the players' pieces were almost indistinguishable.

The program is written in Basic, and there is only one skill level. The computer's moves are average, about equal to the moves of level one on the Sinclair cassette.

The computer does not check if an opponent has had to pass, and if "enter" is pressed without a move being keyed in, your turn is overlooked.

For my money, the Sinclair cassette has to be my choice. Microx Othello is no comparison to Sinclair Reversi, and I would not even consider purchasing it. Sinclair Reversi is available at **£7.95** and Microx Othello at **£3.50.**

Sinclair Reversi

- Getting started 9
- Value 8
- Playability 8

Microx Othello

- Getting started 6
- Value 5
- Playability 5

The growling gravelly voice of **Quicksilva's** Chess program does not add much to the game.

However, its sharp comments on the current state of play do give this program a slightly more human feel.

There's a surge of pride each time it finds itself in more difficulties than it expected and says so on screen. And after being roundly criticised for a queen sacrifice, "That was a pathetic move!" I enjoyed mating it five moves later all the more.

The program does respond quickly at the lower levels but does not play a particularly good opening and has a tendency to capitulate utterly when things start going wrong.

Still, it will give beginners a hard game and will probably hand out more beatings than it takes.

The presentation on the Spectrum is a problem and the screen takes some getting used to. With several of the pieces barely recognisable from their board equivalents. While good chess players know (by colour and position) where the king and queen start a game, learners will not have such a clear idea.

Probably a bit too gimmicky for the more serious chess enthusiast and perhaps not enough thought for the complete beginner to help him around the little things most of us take for granted. It costs **£6.95** and runs on the 48K model.

- Getting started 6
- Value 8
- Playability 5

The Spectrum's graphics face a severe test when asked to produce a good chess board with easily distinguished pieces.

So far I have yet to see a board which is easy on the eye and doesn't have at least two piece symbols too close for comfort. The **Psion** game, which comes courtesy of Microgen, seems to have trouble with pawns and bishops and I had to look hard in some positions to spot a bishop hiding in a pawn chain.

Given this problem and the usual difficulties with keying-in the E2-E4 format, which usually causes me problems when keen to play a good move with black, it's a pity this game does not include a facility to allow you to change mistakes.

Many an interesting position went down the drain after I simply mispressed a square and sent a rook, pawn or queen into a dangerous position instead of the one I intended.

Still this Psion tape is probably the best Spectrum chess around so if you can learn to live with these shortcomings, you will manage to get some decent games out of it.

The levels are 0-9 and levels one, two and three all play a fast and fair game.

The program allows you to set up a board position to play from and I particularly enjoyed the chance to turn the screen position and moves so far onto the Spectrum printer. Current games can also be saved on cassette. The game costs **£7.95.**

- Getting started 8
- Value 8
- Playability 7

VIC-20

Bug-Byte is offering the lowest-priced Vic Chess game I have come across but you will already need to have at least 16K worth of memory expansion on your basic machine.

It also takes a step in the right direction by getting away from the overused notion of chess levels. Instead the Bug-Byte programmers ask the player to input a three-figure number from

Time and motion

The classic board games transfer well to computers who make better than average opponents on all the games dealt with here.

But there is more to choosing a chess, backgammon, draughts or reversi program, than picking one which will beat you every time.

Most important in these programs are a display that is clear and easy on the eye, coupled with pieces which can be easily recognised. Programs which use disturbing colour clashes or badly shaped pieces will hardly help a player trying to give careful study to a critical position.

The program should also draw a player's attention to its move. Both an audio and visual signal should be included to let the player know it's moving and which piece it is changing.

A good response time is crucial. If left to its own devices for long enough most computers can come up with a good move. But long study should be the human player's prerogative — computers are used for their speed.

Finally an easy-to-understand, and implement, move input system will ensure that the program does not start gathering dust after the first few tries. In chess it is difficult to come up with anything better than E2-E4 but this can easily lead to a mistake which is still a valid move and completely ruin a player's chances.

Few programs allow the player to take a move back, try and find one that does.

Other key things to question with regard to chess: does the program always respond to P-Q4 openings the same way? If so you're in for a dull opening repertoire. Does it play forced moves quickly? Does it keep its head when things go wrong? Some programs just give up on bad positions.

TERRY PRATT

0–9.99 to determine the play.

The number before the decimal point is the number of moves it looks ahead at each position. The number after the point refers to the number of positions the computer will consider at each play.

Of course if you start getting ambitious then the computer begins eating into huge amounts of time as it considers vast amounts of data before replying. In play at the lower end of the scale it produced some difficult to understand moves.

The display of the pieces is also a little simplistic and the king and queen symbols are initially confusing. It costs **£7.00.**

- **Getting started** 9
- **Value** 7
- **Playability** 5

Boss plays chess on the Vic-20 only with the aid of an 8K expansion to the Basic memory.

But it is a marvellous piece of software with levels 0 to 9 taking you from a one second to a four hour response time.

There is a good book opening built into this program and it stayed within a known variation usually to the sixth or eighth move on most familiar openings.

Boss also scores on the display, which is more than just adequate — it is produced with a veritable flourish. It accepts entries in four key strokes and will also run chess clocks on both players which offers the additional challenge of trying to beat the computer while taking less time than it does.

A couple of criticisms though: it is difficult to spot the computer's last move as the pieces don't flash after moving and the tape was not a first-time loader. It costs **£14.99** and is distributed here by **Audiogenic.**

- **Getting started** 6
- **Value** 9
- **Playability** 8

Chess in a 3.5K memory is what **Commodore** are offering for the basic Vic-20.

The catch is that it comes in cartridge form with the attendant rise in price to **£21.70.**

But you do get value for money. The game top scores in our getting started category with a simple plug-in operation and a comprehensive booklet explaining what can and can't be done on each of the six possible levels.

The program has a good pedigree, with the Sargon name behind it and is based on the Sargon II program first devised for the Apple.

The board display is easily distinguished and the six levels well spaced out with an almost instantaneous response at the lowest level.

It plays a good game and it's very hard to fault this well put together package except on the price.

- **Getting started** 10
- **Value** 8
- **Playability** 7

ZX81

Artic's 1K Chess is an attempt to get a complex strategy game into the minimum of memory space and as such can only be a compromise.

To make this compromise too much has had to be left out. You are not allowed to Castle, capture en-passant or even promote your pawns and to crown it all even a victory is not acknowledged by the computer. You'll have to spot it for yourself.

The board is little more than an 8×8 square of spaces and inverse spaces with the pieces represented by their initials either in white or black or in black on white. This is the cause of confusion later in the game, when pieces have been forgotten.

Worse still it keeps moving its pieces around the board while it makes up its tiny 1K mind what its next move will be.

Still it does play chess — just — a considerable achievement in 1K.

This is not so much a game as a feat of programming which, in itself, ought to make 1K Chess a collector's item. It does just about succeed in playing chess but don't expect to play too many memorable games on it. Just admire the thought and dedication which made such a thing possible.

A considerable achievement for only **£2.95.**

- **Getting started** 7
- **Value** 8
- **Playability** 4

Backgammon is a three-thousand year-old game of chance and skill for two people. This Psion/Sinclair version for the 16K ZX81, is most impressive.

The cassette is well packaged, with the insert containing five pages of information including the history, rules and all other aspects of the game of backgammon which are relevant to beginners and experts alike.

The program loaded without much difficulty.

There are four skill levels and the game can run in fast or slow mode. This simply means that if the computer is taking it's turn and it is in fast mode, the screen goes blank and it makes up its mind four times faster.

The 81 plays an adequate game at level 1, and plays extremely well at level 4.

The graphics are adequate, with normal and inverse '0's representing the two players' pieces. Entry of moves is very simple, as is accepting or rejecting the doubling cube — which the computer controls very well.

You only have to press one key, and the ZX81 always asks you to confirm your entries.

Backgammon costs £5.95 from Sinclair Research. There is a Dice program on side B of the cassette.

- **Getting Started** 8
- **Value** 8
- **Playability** 8

DRAGON

Dragon Games 1 and 2 are tape compendiums for this new micro from **J. Morrison Micros** of Leeds.

All the games are written in Basic and a great deal can be learned by the would-be games programmer who finds time to study the listings.

Othello, on Dragon Games 1, plays a standard game but it does not give any instructions or rules. Breakout is the second game on this tape and in this version of the arcade machine you play against the clock to score as many points as possible. A conventional bat is not used — you simply fire your projectile using the space bar.

Moonlander is the third game on tape one and is a fairly good representation of this well-known computer game. Awari is a copy of the African national game, which for the uninitiated is played with pebbles. Numbers are used to display the counters, but like Othello you are not told how to play the game.

The final program on Dragon Games 1 is called Raffles. In it your task is to find hidden treasure. A sleeping dog guards the treasure rooms. This is a short graphic adventure — and although simple I found it quite addictive.

It costs **£5.95.**

- **Getting started** 8
- **Value** 7
- **Playability** 7

BBC

If you're a keen Reversi — also known as Othello — player, you'll get extra value for money playing **BBC Publications'** version for the BBC Model A or B.

The games of Galaxy, Gomoku and Mastermind are all included on the same tape, which goes under the name Strategy Games for the BBC micro.

The Reversi game features a well-produced but simple display and I found the move entry system of letters appearing in all the legal positions very easy to cope with. The game plays to a high standard but is not unbeatable.

With the other three games it's good value at **£10.**

- **Getting started** 8
- **Value** 9
- **Playability** 8

ATARI

Strip Poker is a game for the adults who are fed up with Space Invaders, Pacman and all the rest. More precisely it's a game for men as it features two model girls gambling their clothes in a computerised round of poker.

Suzi and Melissa each have their own style of play. One is a skilled poker player the other is fairly inept. The game requires a large amount of memory — 40K — and runs on the Atari 400/800 with a disc drive. Versions will shortly be available for the Apple.

For people who are likely to be trying the game out at work it has the sensible device of being able to black out the screen at any time. Useful if your boss (or the children!) turn up unexpectedly in the computer room!

Strip Poker is manufactured by **Allrian** of Hayes, Middlesex and retails at **£27.50.**

- **Getting started** 9
- **Value** 6
- **Playability** 7

ADVENTURE GAMES

Childhood fantasy

Adventure is what all small boys — and most bigger ones — long for. Remember all those childhood books that took you into a world of excitement and fantasy? Didn't you, like me, wish you were one of the Famous Five?

Adventure gaming will take you one step nearer to your dreams, in the comfort of your own home.

Originally written for large mainframe computers, these games have now been brought to the masses via the micro. Adventures are being published in ever increasing numbers for every popular machine.

An Adventure game makes you the would-be hero. You move about from one location to another, examine things, pick up and manipulate objects, and solve puzzles. But all the time danger lurks and hidden enemies may strike at any time.

Your goal may be anything from collecting priceless treasures to saving the world from disaster. You become part of the story, the computer working to calculate what your actions will achieve within the plot devised by the author.

Don't expect fancy graphics in an Adventure — although there are graphic Adventures. Expect words. Your imagination will provide the pictures — just like it does when you read a good book. And like a good book, you will find it just as difficult to put down.

When buying an Adventure first discover if the scenario and degree of complexity suit your tastes. Games reviews will help here. Find out if the speed of the game is right for you as there is a great deal of variation.

From my experience a minimum of 16k of memory is required for a decent adventure and from there on up the bigger the better. A "save game" feature is useful as it enables you to return to a game where you left it at a later stage without having to leave the machine running all night.

If your computer has sound and colour these will enhance a game. But for the purist a good plot is enough.

KEITH CAMPBELL

ATARI

This is your chance to play sleuth for an afternoon as you are challenged to solve the Murder At Awesome Hall.

Colonel Awesome lies dead on the floor of his 20 room mansion.

You must find out who did it, in which room, and with what murder weapon.

Clues in the shape of an on-screen map of the mansion's first floor and ground floor.

After entering a room pressing "Q" enables you to find out who or what is in a room. If any of the Colonel's associates are in the room you can question them.

The computer will also give you a list of suspects, extra clues if you need them, and the solution for the completely exasperated.

This game is not visually exciting and if you do not like solving puzzles can become rapidly boring.

The game runs on a 16K Atari and is available from **Calisto Computers** at **£14.95.**

- Getting started 8
- Value 5
- Playability 5

SPECTRUM

Faust was a German who sold his soul to the devil, and hid many treasures.

The player is led near to the treasures and must then find them. The creatures encountered in the quest are mutants from long ago.

That is the setting of this game, which although mainly text, is accompanied by mini-pictures of the objects as they are mentioned.

The screen during play has varied colours, which combined with some simple sound effects make for a quite pleasing Adventure from **Abbex** of London for the 16K Spectrum at **£4.95.**

- Getting started 10
- Value 8
- Playability 8

This series of adventures displayed as plain scrolling black text on a pale yellow background, the conversation scrolling continuously up the screen.

In itself this is acceptable. But is spoiled by the fact that when a lot of conversation has been held at one place and the location details have long since disappeared, there seems to be no way of recalling them. The lack of a cursor can also be confusing.

Planet of Death, for the 16K Spectrum, sets you down on an alien planet where your space ship has been captured and disabled. You must find it and escape.

The environment here seemed just like earth to me — very mundane. Most things I tried to do proved impossible or went unrecognised. A weak theme and frustrating game.

Inca Curse, for the 48K Spectrum, places you in a South American jungle outside an Inca temple. This you must explore and return with as much treasure as possible.

Quite a good game with plenty of exploring to do, and points to score, but a disaster from an educational point of view.

Spelling is obviously not the author's strong point! I came across "vandels", an "armary", and "hyroglithics"!

The publishers claim 3200 to be the maximum number of points to have been scored to date. Could this be the total number of spelling errors in the game?

In Ship of Doom which runs on the 48K Spectrum you are in a space ship which has been drawn into an alien cruiser by a Gravitron beam. The aliens are rounding-up humans to turn them into androids.

Your mission — to press the main computer control button to free your ship. There are endless corridors and rooms to roam about, with some strange devices whose purposes are not obvious.

The control button is easily found, but covered by seemingly unbreakable glass! Quite an interesting adventure, if SF is for you!

Espionage Island, again for the 48K Spectrum, puts you under pressure from the start. You are in an aircraft which has been shot at, and you can see a parachute and lever. Your mission is to find the secret of the island on which you were spying from above, but first you must get there.

The island is populated by natives — and hides a guarded camp.

Are the things you find in the wreckage of your aircraft a clue? Can you penetrate the camp? And will you be able to return to your aircraft carrier base? Quite an exciting Adventure.

This series of adventures from **Artic Computing** of Hull, seems to improve alphabetically! I can hardly wait for Adventure 'E'. The Adventures cost **£6.95** each.

Planet of Death

- Getting started 10
- Value 6
- Playability 3

Ship of Doom

- Getting started 10
- Value 6
- Playability 6

Inca Curse

- Getting started 10
- Value 6
- Playability 5

Espionage

- Getting started 10
- Value 7
- Playability 7

At last a realistic 007 adventure! The mode of play is quite different from most Adventure games, successfully recreating the world of James Bond on a computer.

You are 007, of course, and M takes you to Q to choose your weapons.

You then repeatedly select destinations from a list of cities around the world and the micro takes you there.

On arrival you may be offered a ride by a mysterious taxi, or given clues in the form of one letter of an anagram to enable you to solve where a missing jet with a nuclear bomb has disappeared to.

Meanwhile, you must save London from a threat of destruction by Dr. Death.

An original presentation, from **Richard Shepherd Software** of Maidenhead, with authentic 'feel' of a James Bond novel. It costs **£6.50.**

- Getting started 5
- Value 7
- Playability 9

As The Hobbit loads, an illustrated title page is displayed, rather like the cover of a book.

Indeed, the book *The Hobbit* by J.R.R. Tolkien is supplied as part of the package, and it is advisable to read this before playing, since the game follows the theme quite closely.

Another booklet describing how to play the game is provided and includes hints on the plot and how *"Inglish"*, the command language works.

In play the screen is split in two. A "communication window" at the bottom scrolls independently from the "adventure window" above which gives details about the location and action.

On his first visit to a location the player is rewarded with a colour illustration of it.

The action is continuous, since The Hobbit is played in real time.

The creatures go about their business whilst the player is thinking.

Whilst head-scratching is in progress it is quite likely that more messages

will appear on the screen, such as "Thorin goes east through the green door" or "Gandalf gives you the map". The publishers call this feature "Animaction", and it means there is no unique solution, the game being slightly different every time it is played.

A charming Adventure, requiring considerable time to complete.

The Hobbit comes from **Melbourne House** for the 48K Spectrum at **£14.95.**

- **Getting started** 10
- **Value** 9
- **Playability** 9

Pimania really IS different! It is a complete entertainments package!

It all starts with a flashing picture of the Golden Sundial of Pi, a prize worth £6,000 offered to the first person to solve the puzzle.

The player is accompanied by the Pi Man, who starts off by laughing himself silly, and proceeds to offer extremely disconcerting comments.

The game offers a series of puzzles and clues, interspersed with funnies. Like a little man who for no reason walks boldly on to the screen and dances the Hokey Kokey to music, a dog that walks up to a tree and barks at it, and a commercial break offering Pimania tee-shirts in grotesque colours and sizes which are all out of stock!

So when the player gets thoroughly frustrated over a problem, the chances are that a good laugh is just around the corner.

The computer program is complemented by a catchy audio number on the reverse side of the tape, "Pimania" by Clair Sinclive and the Pimen. Show business, pork pies, and a deaf-aid among other things feature in this.

I suspect that there are clues hidden in every part of the whole package, and that it will take a very long time to solve.

One thing is certain — it will never bore anyone with a sense of humour!

Pimania is available from **Automata** of Portsmouth and runs on the 48K Spectrum and 16K ZX81. It costs **£10** for the Spectrum and **£8** for the ZX81.

- **Getting started** 6
- **Value** 10
- **Playability** 10

DRAGON

Go adventuring on your Dragon in the Forbidden City in this text adventure produced by **Apex Trading** of Brighton.

Loading instructions were supplied on computer printout paper and the packaging was poor. Loading was also difficult. The program is short, taking just over a minute to load once your computer accepts it.

It is a standard Adventure. The player has to enter a city, find a treasure and escape. A short introduction to the game gives you three "key words" — the rest you must discover for yourself.

Your location is printed at the top of the screen and the input prompt "what now?" at the bottom.

Various dangers encountered along the way include force fields, lasers and a mysterious green mist.

As with all Adventure games once solved it becomes unplayable. Unfortunately the game did not make full use of the Dragon's reasonable RAM. However it did provide some hours of amusement. Versions available for the Dragon at **£4.95** and TI 99/4a at **£3.95.**

- **Getting started** 3
- **Value** 6
- **Playability** 6

Goblin Caves, for the Dragon 32, comes from **Apex Trading** of Brighton and as with other tapes from this company the packaging was poor and loading presented some problems.

The game is written in Basic and can be listed, so it might prove useful to anyone who is learning the art of programming.

As for the game itself, it's a 3D adventure, the aim being to find and kill a monster with a fire arrow. The arrows are useful protection against any goblins you may come across.

A view of the location you are in is drawn in hi-res graphics. This is redrawn after every move — and becomes annoying after a while.

The player enters the direction he wishes to face and then presses the 'F' key to move forward. The space bar is used to fire arrows.

As it stands this is a fair game, but improvements could be made. I would like to see the monsters and goblins represented graphically — instead of using text. I also feel it would be a better program if it was re-written in machine code. It costs **£4.95.**

- **Getting started** 6
- **Value** 6
- **Playability** 6

APPLE

Softporn Adventure is like no other adventure game you have ever played before. Instead of dealing with trolls and wizards you are challenged to find and seduce three women.

The key to the game is the amount of money you have on you. You start the game with a thousand dollars but this will not last you long as whisky costs a hundred dollars a shot and you will need to bribe the manager of the club to get into his seamy disco-casino. The only way to build up your cash supply is to gamble a few dollars in the casino.

If you are hoping for hi-res graphics depicting scantily clad young women then Softporn Adventure is not for you. It's a text only adventure with only written results of your moves appearing on the screen.

UK suppliers of Softporn Adventure are **SBD Software** in Richmond. It runs on a 48K Apple and costs **£17.95** — far cheaper than a real night out in a seamy casino.

- **Getting started** 9
- **Value** 6
- **Playability** 6

Deadline enables you to play your favourite sleuth for an afternoon as you weigh up the clues in this superb crime solving adventure.

You get a complete dossier of a crime committed on the 7th June 1982 when the wealthy industrialist Marshall Robner died of an overdose of Ebullion — an anti-depression drug he had been taking for some time. But was it suicide or was it murder?

Your brown folder contains all the documentary evidence. This includes the Coroner's report, a large black and white photograph of the scene of death with a white chalk line showing the position and outline of where the body had been found and a letter from Mr Marshall's Attornies.

This immensely popular game in America is now available in the UK from **Pete and Pam Computers** running on an Apple II and retailing athe slightly expensive price of **£39.25.**

- **Getting started** 9
- **Value** 4
- **Playability** 7

The Goblins which gave their name to this Apple adventure, also serve as its most unique feature.

While the player is challenged to pit his wits against a horde of horrible monsters and nasty traps, the Goblins hide in the countryside scenes — presented in hi-res graphics.

If the adventurer is found loitering too long in any particular location, the Goblin will rush in to the attack with a good chance of killing the poor soul off.

The game comes from **Highland Computer Services** of the US and costs **£15.95.** But it has only brief instructions on the disc and far too many arbitrary deaths.

- **Getting started** 6
- **Value** 7
- **Playability** 7

MAZE GAMES

SPECTRUM

Based on Pacman but adding a few twists of its own comes this latest game from the business software firm **Campbell Systems.**

Gulpman offers good instructions with a comprehensive list of game options.

There were fifteen different mazes to choose from with an option to vary the speed of the Gulpman and his chasers.

Another interesting feature is a laser gun with a limited amount of energy with which you can shoot the chasers.

On the minus side Gulpman has pretty basic graphics. The Pacman, for example, moves around the maze without moving his legs. It would have been more convincing had the program simulated some sort of running motion.

At **£4.95** I found this the most playable of the batch of Spectrum maze games tested. The variety of mazes adds interest.

- **Getting started** 9
- **Value** 6
- **Playability** 7

Spookyman sounds more like the title of a new horror comedy film than the name of the latest Pacman type game for the Sinclair Spectrum.

Although the maze looks fairly good the Pacman somehow failed to convince. If you got caught by one of the ghosts the game pauses for an annoyingly long period.

There is also a sad lack of shrinking and gobbling sounds and the characteristic gulp, gulp, gulp, as you clock 200 then 400 and 800. An adequate game but far from exceptional, from **Abbex of London** at **£4.95.**

- **Getting started** 6
- **Value** 5
- **Playability** 4

Mazeman from **Abersoft** is a particularly fast version of Pacman. The speed improves the playability considerably — just as it does in the arcade original with quick responses.

One drawback with this version is that joysticks are not widely available as yet for the Spectrum and playing Pacman without a joystick is rather like Blackpool without the illuminations.

Again on the minus side the game from the Dyfed-based firm produced no sound effects, bonus fruits or flashing ghosts.

Despite my reservations Mazeman was a reasonable version at under **£5.00.** I found it difficult to walk away from!

- **Getting started** 8
- **Value** 6
- **Playability** 5

Cute comic character Hungry Horace adds the sparkle to the Psion software maze game for the Sinclair Spectrum.

In this episode he plays cat and mouse with the park attendants, stealing their sandwiches and eating their prize-winning daisies.

There is also an alarm bell which Horace just can't resist ringing, much to the annoyance of the park attendants.

The maze was a little bit on the simple side and a common problem with Spectrum games is the absence of a joystick — particularly acute with maze games — slightly detracted from my enjoyment.

With this one reservation my overall impression was of an amusing game with entertaining graphics and worth the **£5** price tag. It comes from Melbourne House originally but is sold by **Psion.**

- **Getting started** 9
- **Value** 8
- **Playability** 7

Spectrum Spectres adds a few novel twists to the maze race range of games available for the Sinclair Spectrum.

You play the part of Eddie the electrician lumbered with the unfortunate task of rewiring a mansion which is haunted by four ghosts.

You travel through the corridors placing light bulbs to score points. If you can touch one of the four generators in the maze you can then send the ghosts back to under the stairwell to score bonus points.

Once you have cleared a complete floor you can move upstairs to the next.

There is an added twist in that the generators only have a limited amount of energy which is shown in points at the top of the screen.

This is a most entertaining and colourful maze game with variety in the mazes and game play.

Spectrum Spectres is manufactured by **Bug Byte** at **£5.**

- **Getting started** 9
- **Value** 8
- **Playability** 7

ATOM

The ninth Atom games pack from **Acornsoft** rates as the best of the series.

The three games on the cassette, Snapper, Minotaur and Babies, use graphics and sound effects to the utmost, showing just what can be achieved on the Atom.

Snapper is a version of Pacman, simplified somewhat for the Atom. The changes include turning the ghost pursuers and the Snapper itself into circles (colour circles if you've got the colour encoder fitted) and some simplification of the rules — you don't get the fruit in this game.

When you have run over an energiser, Snapper's mouth falls open and he can then eat the ghosts until it shuts again.

There is only a few seconds of ghost eating time available to you.

The second game, Minotaur, has impressive graphics too. The object of this game is to take all the gold bars from the boxes scattered around the maze and put them in a safe while avoiding the Minotaur who is out to catch and eat you.

All this is done with 3-D pictures of the passages and various objects to be found in them. If you get completely lost, it's possible to call up a map of the labyrinth to show where everything is.

Another scheme for keeping track of events, is to mark the floor with a big cross so that you can remember where you've been. The game is difficult to win and ends when you have put all five bars in the safe or finished up on the Minotaur menu.

The sound effects in this game tell how far away the Minotaur is — he growls when he is getting close.

The third game on the tape is Babies, which has little to do with mazes. It is a close copy of the LCD watch game, in which babies jump out of a burning building and must be caught before they hit the ground.

The tape costs **£11.50.**

- **Getting started** 9
- **Value** 9
- **Playability** 8

TEXAS

The Wumpus lurks in his lair deep beneath the ground. In this labyrinth of caves he waits for the unwary to blunder in and present themselves as supper.

This cave dweller is so deadly that none who have ever entered his caves have ever escaped. He wolfs them down so quickly they never have a chance.

The Wumpus that dwells in the Texas Instruments TI 99/4a cartridge is pretty typical of the species.

The amazing thing is that there exists a breed of tough Wumpus hunters who still wander down into the depths and reckon to have a fair chance of killing the beast.

Their only chance is to fire a special corner-rounding arrow into the correct cave without actually entering it. As Wumpus hunters are only equipped with one arrow, they don't get a second chance.

Dots on the menu

Pacman may well be the last of the great craze arcade games after much mega-hits as Space Invaders, Asteroids, and Galaxians.

Greater competition and an ever increasing number of games releases has created a much greater variety in the arcades and few, if any, definable trends.

But there is an added dimension to the Pacman story. While the game was reaching fever pitch popularity in the US the home computer boom was also beginning to happen. The game was soon converted for the home computer and is now an essential part of the games players collection.

The game takes its name from the Japanese verb Paku — meaning to eat — which aptly describes the simple task of steering a yellow chappie around a maze — gobbling up dots, bonus fruits, and power pills as you go.

There are two types of computer maze game. Straight rip-offs of the Atari original and developments of the basic theme which add a number of original features.

Things to look for when buying a straight copy of the Pacman game are bonus fruits, an authentic and steadily accelerating movement of ghosts, multiplying bonus score for ghost gobbling, and an accurately shaped maze.

If your computer has joysticks then make sure your maze game works with them. And beware, playing Pacman without a joystick is rather like fishing without a rod.

If you opt for an original maze game avoid gimmicky graphics, but look for extra features which genuinely improve the playability of the game.

A choice of different mazes is a useful bonus as it is good fun developing strategies and working out the best routes.

EUGENE LACEY

This seemingly hopeless task can be achieved by the more logical amongst us as the Wumpus leaves clues to its whereabouts. In fact every cavern within two caves of his lair bears the taint of the creature.

By noting these, the player can often logically deduce the whereabouts of the creature.

Other hazards in this maze of caverns and passages include slime pits which offer death just as certainly as the Wumpus itself and a bat who bears grudges against those who disturb it.

This bat will suffer intruders once but, on entering his lair a second time, the player is grabbed and deposited elsewhere in the complex.

Among the different levels of the game, it is possible to attempt to track down the Wumpus in a particularly difficult and twisting series of tunnels. Or, the very brave may even elect to go Wumpus hunting blindfold.

A computer maze game with a long history, Wumpus brings the art of logical deduction to life but offers a pinch of luck which means that sometimes the odds are with the Wumpus. If you like working out mastermind problems, you'll probably enjoy Wumpus-hunting.

The cartridge costs **£19.35** from **Texas dealers.**

- **Getting started** 9
- **Value** 7
- **Playability** 8

BBC

Acornsoft seem to be undertaking a one-company campaign to prove that the BBC is the best games machine around.

They've proved their point to me. Snapper is a Pacman variation which is very close to the arcade game and every bit as playable.

Only keen arcade fans will notice the difference between Snapper and the original. It has a slightly different maze layout but the ghosts make life just as difficult around the new format.

Fruits follow the arcade pattern and the Snapper still has four corner energisers to run to in times of stress so he can turn the tables on his opponents.

The tunnel leading off-screen is also there and you have a high score facility as well as the usual catchy tunes. Marvellous arcade fare at **£9.95.**

- **Getting started** 7
- **Value** 8
- **Playability** 9

ATARI

Larry Bain is a plumber with the Rodent Rooster Plumbing Service who installs pipes throughout the levels of Rat Alley.

This is a maze race game of the Pacman type. Instead of ghosts you are chased by giant rats.

To keep down the rats you are supplied with two cats and two traps. Trouble is the cats are scared motionless and the traps only hold the rats for a few seconds. Although the cats will scare some of the rats there is a breed of super rats running around in this maze who will simply eat the cats.

Periodically replacement cats and traps are dropped in the centre of the maze and these must be picked up quickly before they disappear.

Once you have plumbed one maze completely, another maze commences with smarter rats.

It costs **£22.95** from **Gemini Electronics.**

- **Getting started** 8
- **Value** 8
- **Playability** 8

Atari Pacman is probably the most authentic arcade to home computer conversion ever made, rivalling Acornsoft's Snapper and Commodore's Jelly Monsters.

Books, records, T-shirts, telephones and even suspender belts have all been marketed in the US carrying a motif of the cute little yellow gobbler.

Computer gamesters need no introduction to Pacman but for the uninitiated it is a case of running around a maze gobbling wafers, bonus fruits, and power pills whilst dodging the four ghosts that are in hot pursuit.

Not to be played if you have an appointment. Pacman runs on an Atari 400 or 800 and is available in cartridge format from most Atari stockists at around the **£30** mark.

- **Getting started** 9
- **Value** 6
- **Playability** 9

VIC-20

With the disappearance of Bug Byte's excellent version of Pacman for the Vic 20 under the threat of legal action from Atari — the owners of the Pacman copyright — Puckman is one of the few authentic versions of the game left.

Puckman has all the principle features of the arcade game. The ghosts chase you through a maze full of dots which you must eat up as you go along. If you eat the power pills in the corners of the maze you can eat the ghosts.

Every so often a bunch of cherries appear in the centre of the maze which are worth a lot of extra points.

The graphics are surprisingly clear considering that the game is written for the unexpanded Vic.

My main criticism is that the Pacman is difficult to negotiate through the maze as the keys that move him tend to stick.

Once you press a key to move him he will continue in that direction even when you take your finger off the key.

Puckman is available from **Morris Associates** at **£5.50.**

- **Getting started** 8
- **Value** 7
- **Playability** 6

SPACE ATTACK

APPLE

Pilot the Starblazer on a mission to destroy enemy radar bases which are ruining your chances of a successful mission.

You can only bomb the bases from close range which is particularly difficult to do without crashing into the pylons.

Points are also awarded for bombing the radar out-buildings though you cannot fly on to the next part of the mission until you have destroyed all the radar dishes.

Once the radar installations have been destroyed the Starblazer zooms up to the top right hand corner of the screen and mission two flashes up the message "destroy supersonic tank". This, alas, is easier said than done.

First you must dodge or shoot a barrage of missiles which fly at you at great speed moving left to right across the screen. If you survive this lot you then attempt to divebomb the supersonic tank which — maddeningly — seems to be always out of your bombing range.

A most addictive "shoot 'em out" game.

Starblazer runs on an Apple II in 48K. It is available from **Software House** at **£19.**

- Getting started 9
- Value 7
- Playability 9

A dual sensation of flight and speed are the two key attractions in a new 3D-Apple space game from America called Zenith.

Your mission: defend the new space city which is being constructed to house the inhabitants of the old galaxy. The aliens are attacking. Spiralling towards you in colourful geometric shapes.

You wrestle with the joystick in an attempt to keep your ship steady, and get the aliens in your gun sights — as the chequered ground sways to and fro, zooming past beneath you.

Zenith is produced by the new American software house Gebelli.

The games impressive playability and superb graphics put it firmly in the highly recommended category with plenty of action.

It is available in this country from **SBD Software** at **£21.50.**

- Getting started 9
- Value 8
- Playability 8

The meteor storm

Science fiction buffs have explored the galaxies from the comfort of their armchairs for decades thanks to authors like Michael Moorcock, Arthur C. Clarke and Frank Herbert.

Now there is an even easier way to stretch your imagination out into the stars — through the medium of home computer space games.

You are now the space hero battling against evil forces intent on the destruction of the earth or event the universe. Pit your wits against alien beings with powers beyond imagination. In fact imagination is only limited to the type of program that you can obtain for your micro.

In this article we tell you some of the things to look out for when buying a computer space game.

Whatever type of micro you own, you may be sure that there will be a number of space programs to choose from.

Buying software by post means that you have to rely on advertisements when making your choice, but you can also choose from the ranks of cassettes on display in local computer shops. And don't forget that magazines, like *Computer and Video Games* publish games.

It is not possible to recommend a set type of space game program as many of the features are matters of individual choice.

Straight forward attack games in the Space Invader vein still have a lot of appeal and some of the latest versions based on this theme are excellent.

Programs are available to take you into the realms of space adventure where deduction, strategy, memory and planning are as much a requirement as quick finger on the fire button.

Micro versions of arcade games like Defender and Galaxians, to name but two from a vast selection, are fast, colourful, highly playable, and in some recent cases extremely authentic versions of their arcade counterparts.

With the advent of the new generation of low priced computers, high standards are expected with this type of program. So look for good presentation with clear instructions.

Where applicable the program should have high score facilities as well as good use of colour and sound. But the main points to look for are excitement and enjoyment without which the games will not hold you attention for long.

PAT NORRIS

SPECTRUM

For sheer frenetic action it's hard to beat conflict with the hordes of Winged Avenger from **Workforce.**

These outer-space fleets dive out of the sky, scattering bombs in all directions and challenging you to match their fearsome fire.

You are represented on the screen by a small laser base, with left and right controls plus fire and shield.

A timer ticks down from 500 and you have to get rid of wave after wave of aliens. This can be done in two ways, by shooting them or by running into them while they spend time on the ground.

Both are equally effective. But as the aliens have a tendency to swoop down at your position regularly, it is possible to build up quite a score by merely staying still and letting them crash against you — I have wiped out whole waves without touching the controls.

There are speed levels from a sedate 0 to a hectic 6 and the aliens come in three waves. First the small round variety, then as large green birds which can lose wings without being affected. And finally in a mothership which contains a fuel cell. If this is blasted successfully the timer resets and you can start all over again.

Guaranteed to give you an aching wrist, Winged Avenger, unfortunately, doesn't leave much scope for tactics. It costs **£6.95** for the ZX Spectrum.

- Getting started 8
- Value 6
- Playability 4

Arcadia is advertised as the "meanest shoot 'em up game ever" and it certainly does give you a wierd and wonderful assortment of aliens.

They attack in eleven waves of progressive difficulty and come in different shapes and sizes.

You can move from left to right across the bottom of the screen and also thrust forward.

The game makes good use of the Spectrum's colour capabilities but most importantly it lives up to the advertisement blurb and gives you a good addictive game of space attack.

Arcadia is produced by the new Liverpool software house **Imagine** and is also available for the unexpanded Vic 20. Both versions are available at **£5.50.**

- Getting started 8
- Value 8
- Playability 8

DRAGON

Dragon Games 2 features Snake, Lander and Space Invaders. All three are written in machine code. The first two use the highest resolution and so are in black and white — but this does not affect the quality.

Snake is similar to the arcade version. The aim is to gain as many points as possible by shooting the snakes. You move your man around the screen using the cursor keys. He fires when you press the space bar. An entertaining and addictive game.

Lander is another interpretation of an arcade game. It's a standard version which gives you the choice of two landing-pads — worth differing amounts of points. The cursor keys are used to control the craft — and this requires a lot of skill and practice. I found myself playing this game more than any other.

I could suggest a changing landscape as an improvement — otherwise it's an excellent adaptation.

Dragon users will be pleased to see the classic video game — Space Invaders — up and running on their micro. Being in machine code, movement of the alien invaders is smooth. Although not as good as Dragon Data's own version on ROM cartridge, it is better value for money.

From **J. Morrison Micros,** it costs **£5.95.**

- Getting started 9
- Value 9
- Playability 8

Enclosed with my copy of Dragon Trek, produced by Salamander Software for the Dragon 32, was a short letter containing the aims of the producers "to offer high quality professionally packaged software at a reasonable cost."

After a battle loading badly produced software from other companies I was sceptical about this claim. However, I am very pleased to say that my fears were unfounded. In fact I think Salamander surpassed their aim.

Dragon Trek came attractively packaged with comprehensive instructions

in a thorough 16-page flight manual.

This is a real time version featuring full colour tactical status and long range scanner displays, hyperprobes, tractor beams and Klingons. A lot of work has gone into producing this tape!

The various displays are all well designed and arranged – easy to read and understand.

The aim of the game, of course, is to wipe out the Klingon fleet. Using various keys you can call on your long range scanner, call up a damage report, go into warp drive, or send your hyperprobe on ahead of the Enterprise to see what's going on.

On challenging a Klingon you can activate your defence screen and choose your weapons – phasers or photon torpedoes. Phaser fire is controlled by your on-board computer and you direct a torpedo using your joystick.

When energy is running low docking with a starbase will recharge them and replenish your weapons.

Black holes and supernovas add extra hazards as you journey where no man has gone before.

I find it difficult to fault this tape, but perhaps the explosions of Klingon ships could be a bit more dynamic.

Excellent presentation along with good use of the Dragon's facilities left me thinking – why can't all software come up to this standard!

At only £6.95 order your copy now – before they sell out! Sorry I have to go, my crew needs me ....

- **Getting started** 9
- **Value** 9
- **Playability** 10

BBC

As close a copy of the brilliant arcade game of Defender as you are going to get on a home computer.

That's **Acornsoft's** Planetoids which runs on the BBC Model B. If anything, it is slightly faster than the arcade original.

You have the scanner on the top of the screen to show the entire planet surface, so sneaky landers can't grab humanoids away from the main action without your knowing. The aliens and the sound effects are faithfully reproduced and all the usual controls are there.

These seven necessary keys to control your craft take some getting used to and in moments of extreme panic I still find my fingers thudding down on quite useless parts of the keyboard, but that is part of the skill of the game.

If you are a keen Defender fan from way back (about 1980) and are still unconvinced that the detail can be as close as I've outlined, let me assure you.

The third wave often finds all three pods in smart-bombing position on the screen and the programmer has even included Swarmer "bleed" should you slightly miscalculate on this tactic. Marvellous entertainment and pure addiction at **£9.95.**

- **Getting started** 8
- **Value** 10
- **Playability** 10

ZX81

Invasion Force is an original and addictive game from **Artic Computing** of Hull. You are under attack from an alien command ship with a fleet of bombers which form the advance wave.

Below the ships is a wall, constantly moving from right to left obscuring your line of fire.

Your mission is to destroy as many bombers as possible, earning 1000 points for each one downed. Ultimately you will have to gun for the base itself but this is pretty well impossible.

There are two levels of play – which is a bit of a minus as I would have preferred a third faster level.

My only other criticism is that after each game you must go back to the instructions. It would be better if you could simply press a key to continue.

Despite these drawbacks my overall impression was one of an enjoyable addictive game. It costs **£3.95.**

- **Getting started** 9
- **Value** 6
- **Playability** 7

ATARI

Moonbase Io – pronounced eye-oh – is an arcade-style space game. It is actually a combination of three games – inspired by the recent flights of Voyager 2 to Jupiter.

The "Io" in the game's title refers to one of the four major moons of the solar system's largest planet. Since Jupiter was discovered to be a large mass of inhospitable liquids and gasses, unsuitable for landings.

This game uses the moons Io, Europa and Ganymede as moonbases for your spaceship. This choice of bases, however, has upset the local bug-eyed population and they are determined to send you back where you came from or destroy you in the attempt. The aliens launch swarms of ships to battle against your probe.

One particularly outstanding feature of this game is the synchronisation of the graphics with a soundtrack on a separate voice recorder. This gives you a full briefing from Cape Canaveral the first time the game is played.

There was a slight snag here though. It was not always easy to synchronise the voice tape with the play tape.

Moonbase Io provides a fast machine code game with player-missile graphics, redefined character sets, fine scrolling and impressive sound effects.

The game has three phases. To secure each of the three moonbases, the player must pass a docking phase – impeded by swarms of aliens and the nearby moon – and if successful, transport to the surface of each moon for a phase which involves defending the base against more formations of aliens.

In addition there are seven skill levels – from novice to galactic wizard – with variations in scoring and reserve ships. Some hidden features are also promised, although I never managed to survive long enough to experience them.

Moonbase Io runs on an Atari 400 or 800 in 16K and requires a joystick controler and can be obtained from **Centresoft** at **£24.95.**

- **Getting started** 6
- **Value** 6
- **Playability** 8

PET

A space mayday message brings a swift response from your mothership in Space Rescue.

Five spherical life support pods are stranded on hazardous alien terrain in this Pet game and your job is to bring them safely aboard the ship.

Out of the rescue hatch goes the ship's recovery shuttle which is controlled by means of the Pet's keypad. The shuttle is released by pressing a "2" to move it planetwards and from this moment your score increases by one for every second you survive.

To rescue a pod, the shuttle must be positioned immediately above it, and the "A" key pressed. This manoeuvre can be difficult on the higher skill levels since the shuttle moves quickly but the control key is responsive.

Next, the shuttle should be guided to a position just above the mothership and the pod dropped through the rescue hatch by pressing "D". If you miss the pod drops back to the planet surface.

On saving all five pods, you are invited to dock with the mothership for a bonus of 500 points and then it's on to the next skill level to try and repeat your hard-earned rescue.

Supersoft has succeeded in creating another addictive game purely because it is so hard to master. It costs **£8.**

- **Getting started** 5
- **Value** 7
- **Playability** 9

NOVELTY GAMES

BBC

Can you throw the switch that stops the robot before he blasts you? That's the challenge issued by **Viking Software** of Bournemouth on their latest tape for the BBC B — oddly enough called Robot!

You control a little man being shot at by a big robot. Unfair, I hear you shout. The little man can save himself by dodging the robot until he gets to the bottom of the screen where there's an OFF switch which will immobilise the metal monster.

This is an addictive game — although it's a bit slow having been written in Basic. It costs **£4.95.**

- Getting started 7
- Value 7
- Playability 7

APPLE

A belligerent old soldier refuses to leave his wartime enclave high in the Cannon Blitz Hills.

For him the war still rages and he will shower anyone who passes below with cannon balls. You must dodge the cannon balls and escape to the next level where a balloon is waiting to carry you safely out of range.

At the third level of this game you have to jump from platforms onto a moving escalator which takes your little man to the top of the hill where he can deal with the old soldier.

A game of impressive graphics with obvious associations with the popular arcade game Donkey Kong. Cannon Ball Blitz is available from **Spider Software** at **£19.95** on disc for the Apple II.

- Getting started 9
- Value 6
- Playability 6

ATARI

Pogoman will make you jump with joy. The idea of the game is to make Pogoman jump up and put out the street lights. Points are awarded for each lamp blacked out.

Move the joystick slightly to the right and Pogoman will do a little bunny hop. Pull the joystick down and you add height to his jump — push up and you stretch him further.

As Pogoman moves down the street past trees, office blocks and parked cars a number of obstacles appear in the road in front of him. All these must be jumped over in order for him to continue.

The further he gets the more difficult the obstacles become. A bird swoops down from the sky to try to knock Pogoman off his stick.

There is also a guard who rushes out from the right hand side of the screen to knock Pogoman down. Pogoman runs on Atari 400 or 800 with versions available on disc or cassette.

It is imported into the UK by **Calisto Computers** of Birmingham and sells at around **£20.**

- Getting started 9
- Value 6
- Playability 8

Those crazy Duke Boys have been making moonshine again and gunning the souped-up General Lee around Hazard County leaving the sheriff in a spin.

This game turns reckless driving into an indoor pursuit.

You are at the wheel of the souped-up Chevvy as you drive through farmyards, lanes and twisting country roads.

The sheriff is on your tail and you will need to drive smartly to give him the slip or make a spectacular leap across the river and watch his car nosedive into the water as he tries to follow you.

Hazard Run is based on the popular American TV programme the Dukes of Hazard.

The game is available from **Allrian** of Middlesex, running on the Atari 400 and 800 and retailing at **£21.50** for cassette and **£24.95** for disc.

A good novelty game if a little pricey. But it does allow you to relive the TV series.

- Getting started 7
- Value 5
- Playability 6

VIC-20

Shadowfax brings one of the most exciting chapters of *Lord of the Rings* to the screens of your Vic computer.

The game takes its name from Gandalf's horse — the swiftest beast in Middle Earth.

This is your chance to ride Shadowfax as you gallop against the Black Riders of Sauron — the Dark Lord of Mordor.

The idea of the game is to shoot as many of the advancing Black Riders as possible. To kill the Riders you must release a thunderbolt by pressing the shift key. Quickly release the key when the bolt is centred on a Black Rider — this will explode the bolt — killing the Rider — which then glows red and disappears.

If you fail to release the key quickly enough the bolt will pass through your target and leave him unharmed.

The graphics are most convincing — particularly the galloping motion of the horses.

A highly original and addictive game. Shadowfax is available from **Postern Limited** of Cheltenham at **£9.00.**

- Getting started 8
- Value 8
- Playability 8

Hopper is Frogger with a whole lot of differences. The game has undergone some **Rabbit Software** replanning on its way into 3.5K of memory for the Vic-20.

You still command a hopping creature and it still has to get over a busy road and across a log-filled river to one of five bases in a bank to score, but there the similarities end.

This poor amphibian also needs to negotiate parked cars on either side of the road, he has to avoid houses on a grassy verge in the middle of his adventure and finally he has to **swim** the river **avoiding** the brown logs!

All this and a quickly counting down time limit serve to make the game more difficult than the arcade original, but not as enjoyable.

Hopper is rescued by some very suitable sound effects which sploodge him around the screen with such an air of dampness you feel he's leaving a soggy trail behind him.

The parked cars and houses are immobile, so add little to the game, five streams of traffic on the road are easily crossed with the two lanes of brown speeders being quite infrequent.

This leaves the river, which is where the difficulties start. It's seldom that a free white route leading to a home base becomes visible in the brown murk. When it does it's usually closed before you get across. So you're left hopping between the logs enclosed on all sides hoping a white space will appear above you.

But this tactic falls down as you are not allowed to hop along the bank at the end to a home base.

Hopper costs **£9.99.**

- Getting started 9
- Value 5
- Playability 4

Cute is crucial

The video games business in America has until quite recently been referred to as the recession proof industry.

Its astonishing growth over the last few years has been due in large part to the wizardry and imagination of the games designers.

As well as the ubiquitous "shoot-'em-up" space games we have had exciting adventure games like Tutankham and Space Dungeon and more recently sheer fantasy with Donkey Kong and Pengo.

Most computer gamesters will be familiar with Donkey Kong and Frogger and versions based on these novelty games are now available for most of the popular micros.

There is no need to restrict your purchases to straight copies of arcade hits. There are no rules for novelty games. The only restriction is the breadth of imagination on the part of the programmers and game designers.

Despite this there are some common elements which you should look out for which will collectively contribute to a good game.

Good graphics are by definition crucial to the success of novelty games. The characters must be cute or plausible, well defined, and above all central to the general theme of the game.

Sound effects can often make or break novelty games. Some of the new arcade machines excel here, such as Pengo for example, with a trio of tap dancing baby penguins who do a little number for you if you get a sufficiently high score. Your home computer will not be able to provide a song and dance routine but providing the program is a good one, it should be able to produce some impressive sound effects, and this is definitely something to look for when making your purchase.

Graphics, sound, and plot are all important elements of a good novelty game but they can never compensate for a game that basically is not playable. Look for that little twist in a game which will keep you coming back for more.

EUGENE LACEY

ASTEROIDS

Firing to escape

Who can resist blowing up asteroids? To have them careering about in the privacy of your own home is sheer ecstacy!

But what flavour do you prefer? This game has been multiplying at an alarming rate and with so many about how do you choose?

The first consideration must surely be how fast, there is little point getting either a game that is so slow that it bores you to death or so fast you find it unplayable.

Next consider the controls you are offered, rotate left, rotate right and fire are universal but what of hyperspace and thrust? Is the thrust of the move stop variety or a true inertial thrust (turn round and thrust to stop yourself moving).

Then you may consider features: How many sizes of rock do you get? Two, three or more? How many saucers do you get, do they fire at you? Have you a wrap around screen? What does the game look like? Does it have hi-res graphics, colour?

Does it have different attack waves (more rocks each wave)? Does the game have an attract mode, full scoring, high score, bonus ship?

Finally, does the game have any special features such as particularly outstanding graphics, sound or speech?

A game that has most of the above features is likely to be fairly close to the arcade original and give you hours of entertainment.

MARK EYLES

DRAGON

Software for the Dragon 32 is gradually becoming available and arcade fans with one of these new microcomputers will be pleased to see two versions of video game favourites for their machine.

Meteor Run — a version of arcade asteroids — and Breakout are two games on a tape titled Arcade Action produced by **Apex Trading** of Brighton.

Loading instructions were supplied on a sheet of computer printout paper. The instructions were short and precise, but the packaging was poor.

The cassette interface of the Dragon has always proved reliable but loading these games turned out to be a long struggle. Breakout defeated this reviewer — and on listening to the recording I found it to be really quiet.

Meteor Run was also a struggle to load — it's a pity it wasn't worth the effort. It is a short program written in Basic. You control a space craft — using the left and right cursor keys — while dodging meteors represented by red graphic blocks. You have to shoot enemy ships using the space bar to fire your laser.

It held my attention for all of two minutes — but being in Basic it can be listed and may be helpful to beginners.

All in all this was a very disappointing package — one not worth the **£4.95** price tag.

- **Getting started** 2
- **Value** 4
- **Playability** 3

ZX81

Electric Pencil Company's version of Asteroids for the ZX81 is the best I have played. It has superb instructions, it is fast, has great graphics and good game options.

The spaceship was cleverly represented by either an 'A', 'V', 'D' or 'C'. Block symbols from keys Q, W, E and R were used for 45 degree angles.

There are four sizes of Asteroids and these were just about right. Their speed varied during the game — getting progressively faster.

The game has five speed levels. Level 3 should satisfy all but those of you who score a billion points for 20p.

There is an option for doubles or singles and the five top scores and names can be displayed.

A great game for one or more players, this version of Asteroids is manufactured by the **Electric Pencil Company** at **£3.95.**

- **Getting started** 8
- **Value** 8
- **Playability** 9

Quicksilva Asteroids for the ZX81 got off to a bad start as it did not supply any game play instructions.

After a lengthy process of key fumbling I managed to locate the correct controls and played a fairly average game.

There were no alien saucers to shoot at for bonus points and the asteroids themselves were just clusters of 'O's.

I found it difficult to tell which way I was facing as the ship is represented by a number from 1-8 — depending on which way you're facing. It will take you some time to master the controls.

Responses are fairly fast and you can turn clockwise (7 or 4), anti-clockwise (5 or 6), fire (1 or 0) and to thrust forward (2 or 8).

Flash packaging fails to rescue a particularly mediocre version of this hit arcade game. It costs **£3.95.**

- **Getting started** 2
- **Value** 5
- **Playability** 5

BBC

Asteroid Belt is a version of the popular arcade game asteroids for the BBC model B.

Armed with a photon cannon, your mission is to destroy the oncoming onslaught of rocks before they collide with your ship.

The larger asteroids split into two when hit to the sound of a satisfying rumbling noise. These may be, in their turn, split to become two small asteroids which, if hit again, will become cosmic dust.

You have a hyperspace button which will make you momentarily disappear and then randomly replace you somewhere on the screen.

The game is reasonably fast with adequate sound effects.

On the minus side the operating keys were ridiculously far apart and the ship would not turn quickly enough.

A reasonable game but not without a few flaws. From **Computer Concepts** for **£8.97.**

- **Getting started** 7
- **Value** 4
- **Playability** 4

SPECTRUM

Meteor Storm is a close copy of arcade asteroids for the Sinclair Spectrum.

The asteroids were represented as geometrical - line drawings drifting weightlessly towards your ship.

The game displayed clear instructions on the screen and also showed you the value of the various asteroids and flying saucers on the screen.

The game kept a running total of the high score and also allowed you to enter the initials of the top 10 high scores of the session on a hall of fame chart — in true arcade style.

You are also provided with a keyboard overlay which, although it seems just like a gimmick, is actually quite useful in Asteroids where you have five controls to concentrate on.

A most playable and authentic version of the hit arcade game.

The game runs on the Spectrum and is available from **Quicksilva** at **£4.95.**

- **Getting started** 5
- **Value** 7
- **Playability** 8

Official Sinclair writers **Psion** have entered the battle for Spectrum asteroids with Planetoids.

This game is not quite so close to the arcade original as the Quicksilva version though it is none the less impressive for this.

The game has an excellent fire mechanism — the missiles could be fired in quick succession and reached their targets swiftly. The game had the essential five features — rotate right, rotate left, fire, thrust and hyperspace.

This version also includes the missile-spraying UFOs which really add spice to an Asteroids screen and usually warrant a torrent of abuse after one of their more successful excursions.

One drawback was the lack of inertia on the thrust button. This makes the game slightly easier to play but would upset the purists who want to play arcade Asteroids on their own TV sets.

Despite this one reservation, the game plays pretty good Asteroids and is a more than reasonable piece of software for **£5.95.**

- **Getting started** 5
- **Value** 6
- **Playability** 7

Softek Meteoroids is the third and final version of asteroids we tested.

It too offers most of the features we have come to expect from the arcade original.

However the **Softek** programmers have also tried to get away from the usual asteroid design of craggy white outline and little else inside. The Softek version features an admirable attempt to simulate the rock-like texture of asteroids.

This version has been written to work with some of the new Spectrum joysticks. An adequate game of Asteroids.

- **Getting started** 5
- **Value** 5
- **Playability** 6

SCRAMBLE

APPLE

Choplifter is the top selling game in the US for the Apple computer.

Superb graphics and superior game play have shot it to the top of the charts.

You play the part of a helicopter pilot on a mission to rescue hostages trapped inside enemy barracks deep inside hostile territory.

Each time you rescue a hostage the computer emits a high-pitched bleep telling you that the hostage is safely aboard.

You can only carry 16 hostages without overloading the chopper so you will have to make more than one sortie into enemy territory.

The number of hostages rescued and tanks destroyed is recorded at the top of the screen.

The game is best played with joysticks although this reviewer played quite an interesting game using paddles. The helicopter can fly backwards, forwards and sideways — leaning into a dive most realistically. it is also quite difficult to control and will take you some time to master just as a real helicopter would.

A most addictive game and easy to see why it did so well across the Atlantic.

The game is available from **S.B.D. Software** and costs **£19.95.**

- **Getting started** 9
- **Value** 7
- **Playability** 8

ZX81

Take up the Gauntlet and tackle a thrilling subterranean Scramble challenge for the ZX81.

The object of the game is to fight your way through fortified caves with bombs and a laser gun. You start with three craft and get one more every 6,000 points. These are controlled by: "Q" key for up and back; "W" for up and forward; "A" down and back; "S" down and forward.

"B" and "M" give you control over your guns and bombs, and the game is quite easy to get to grips with.

You are actively encouraged to make a copy of the game but that hardly proved necessary as the game loaded every time and the instructions are also very clear.

The first part of the game leaves you in the open, then you enter the caverns and take on some aliens. In stage three you encounter the meteors and level four has only a narrow channel to fly down. That was as far as I got (8,300 points if you want to try and beat it).

In all there are six phases to the game which requires a 16K Rampack and costs **£3.95** from **Colourmatic.**

- **Getting started** 9
- **Value** 8
- **Playability** 9

VIC-20

Vic Skramble from **Terminal Software** is a miracle of memory conservation. How it ever came to be crammed into the unexpanded Vic's 3.5K is a mystery to me.

The Vic's clear graphics are used to good effect with helicopters, planes, oil tanks and missiles all convincing. My main quibble was that this game could not be played by joystick but with one control more than the average joystick can handle, that is perhaps understandable.

As it is, the flight control keys: fast, slow, the crucial up and down, are in the "+" position and take a lot of getting used to. The other controls are laser and bomb.

You are faced with eight challenges in this thrilling and addictive game. First travel overland, bombing as much fuel as you can to keep energy up, blasting missiles and helicopters on the mountain ranges.

In stage two the missiles fire back launching into the air, stage three takes place in the Wiggy tunnel and that's where I met most of my destructions. Stage four is set in the cavern, stage five on the meteor trail, stage six takes you over Rocket City, stage seven offers the dreaded city maze and finally a homing shot makes up the final challenge.

A very valid attempt to reconstruct the arcade original. It costs **£7.95**. One bug though, a mistaken "shift" combined with "CTRL" (all too easy considering the controls) and the game wanders into the murk of switched character sets.

- **Getting started** 6
- **Value** 8
- **Playability** 8

SPECTRUM

Penetrator is my pick of Scramble-type games for the Spectrum.

It succeeds in being immensely playable yet very difficult and horribly addictive.

Nice touches include a large number of radar scanners which constantly rotate as you fly over them. These are worth more than points, for unless you blow them up, they collect data about your flight plan and enable missiles and enemy paratroopers to track you more successfully.

This is shown in a danger level indicator on your console. The more radar scanners left operative the more likely the missiles are to blow you from the sky. There is only one way to reduce the danger level, blowing up the enemy's neutron bomb store. Four stages to the game before you meet the neutron bomb HQ and try to return to base.

Your controls are very responsive — they need to be — up, down, thrust, brake, fire and bomb.

There has been a lot of careful thought gone into the way the controls work. Thrust and fire are on the same key but operate independently and the whole bottom row of the Spectrum keyboard is given over to bomb.

You can customise your own Penetrator maze. The game allows you to build up your own scenario with radar installations, missiles, caverns and steep hillsides. But it is a time consuming exercise so it's well worth saving the finished product.

In view of all this effort on the part of the marvellous **Melbourne House** programmers, it's a pity they didn't curb their keenness for presentation techniques a little.

The firing rockets and slow writing out of "Penetrator" is pleasant the first time but pales a little when you are keen to get on with the game and improve your score.

But this is my only criticism of a well-conceived piece of software.

It runs on the 48K model and costs **£6.95.**

- **Getting started** 9
- **Value** 10
- **Playability** 9

ATARI

Airstrike is a very well executed derivative of the popular arcade game Scramble.

The object of the game is to pilot your spaceship through underground caverns while avoiding numerous obstacles that are placed in your flight path.

The first obstacles to be overcome are surface-to-air missiles and the occasional floating mine. On you way through this part of the cavern you pick up more ammunition and fuel. In the second part of the cavern you may have to deal with a whole series of floating mines.

Once through this part you come across a series of airlocks. The only way to get past these is to shoot the middle out of them and manoeuvre your craft through the resulting hole. You may also encounter the occasional enemy fighter who will try to shoot you down.

Each level has a different colour and your craft carries less ammunition due to the higher gravity.

This really is a most impressive game and the English Software Company are to be congratulated.

Airstrike is available from **Gemini Electronics** at **£19.95.** The game runs on an Atari 400 and 800 in 16K with a disc version also available.

- **Getting started** 8
- **Value** 8
- **Playability** 8

One way travel

Scramble was one of the hit games of the post Space Invaders boom and still hangs on stubbornly to its prime positions in arcades, pubs and motorway services.

Its addictiveness is due to the challenge it sets you to get further. It's not how much you score that concerns the Scramble fan so much as how far he can get. Can you get beyond the yellow zig-zaggers, or the red fireballs? Or have you got into the maze yet, and if so how far have you got into it? Ultimately, have you shot the robot? This is the supreme test for Scramble aces who have successfully piloted their craft through the preliminary levels.

Any computerised version of this popular arcade game should recreate this graded level of difficulty. This can be achieved by varying the speed of the attacking aliens or the difficulty of the scrolling terrain to be flown over. There must also be some final adversary like the robot in the arcade version. It is crucial to be able to move backwards and forwards as well as up and down. Scramble can only really be enjoyed with a joystick. A good version will enable you to bomb and shoot at the same time.

EUGENE LACY

FLIGHT SIMULATION

ATARI

If you have ever wondered what it feels like to be at the controls of a 747 thundering across the Atlantic with a plane full of passengers then wonder no more and give it a try.

Jumbo Jet Pilot challenges you to take off, fly to a selected destination and touch the plane down safely again. Sounds easy? Well just you give it a try.

There are nine different dials to keep a constant eye on. Altitude, compass, artificial horizon, pressure gauges, and the instrument landing system — all authentic flight controls.

The game gives you two screen presentations — the view from the cockpit with dials, and a map showing the layout of the airport and your destination.

To begin you have to taxi the plane out on to the runway and then build up speed fo the take-off. The sound effects are quite impressive during this part of the game as the roar of the engines build up when the plane gathers speed.

My main criticism of the game is that it is rather slow. Once you have successfully taken off and correctly set the bearings for the flight you could almost go and make a cup of tea. It was just like switching onto automatic pilot, which may be realistic, but personally I also found it a little boring.

Again on the minus side, if you crash the plane you must go right back to the beginning, taxi out and take off all over again. It would have been better if you could resume where you left off or at least if it had a final approach option.

An impressive piece of programming but I feel I could do better for my money.

Jumbo Jet Pilot runs on Atari 400 or 800 and is manufactured by **Thorn EMI** and available from Spectrum computer shops at **£34.44.**

- **Getting started** 9
- **Value** 5
- **Playability** 5

SPECTRUM

The instrument panel comes into its own in Night Flight, because there's not much else to see out of the windscreen, it's all pitch black.

In **Hewson Consultants** version of flight simulation you are faced with the problem of landing a light aircraft in the night. The screen is divided into two with the bottom half being taken up by instrument readings, while the top half is given over to the view from the cockpit. This remains dark until the landing strip lights come into view.

A very simplistic map shows the world outside as consisting of a range of hills right across the screen at a height of 1,650 feet with one small valley to the west of the runway which itself runs east-west.

Above 2,200 feet the airspace is very congested and there is a high risk of collision.

Apart from the map there are six modes to try out: mode 0 is a demo shown over the last 2½ miles of a successful approach; mode 1 leaves you nine miles from touchdown heading west; mode 2 is the same heading east; mode 3 leaves you heading north and mode 4 asks you to take off first. The final mode is on autopilot and shows you how it should be done but allows you to take over at any time.

As in most simulations there is a wealth of controls and things to consider and it is initially very confusing.

Raising and lowering the airplane's nose, checking on engine rpm, banking, lowering flaps and landing gear while checking constantly on your heading against the directional beacons, airspeed, altitude and fuel.

Still it is hardly the most complex of simulations and the night idea does give an excuse to bring the necessary memory down to 16K. It costs **£5.95.**

- **Getting started** 8
- **Value** 7
- **Playability** 7

Realistic training

Commercial flight simulators are used in the training of airline pilots and are now so good that they provide a genuinely realistic simulation of flying in a jet.

These simulators use large computer systems and cost anything from a few million pounds upwards, but a more modest range of flight simulation programs for the home computer are now becoming available in the price range £5 to £50!

As with all software, paying a higher price will not necessarily buy you a higher quality program. Here are a few features to look for.

The most technically difficult component of a flight simulator is the representation of the outside world. This should include at least the horizon and a representation of a runway — any additional features are a bonus.

Landing a plane on a runway is the most exciting part of flight simulators and it is important that this part is done as well as possible.

Home computers are not capable of displaying a real instrument panel but it is possible to create an impression of a vast number of gauges and dials which give the feel of a real cockpit. Analog displays like gauges and dials in addition to digital displays are more authentic, interesting and easier to read.

Landing a plane safely is one of the most difficult tasks the pilot has to perform and this should be accordingly difficult and instructive in a flight simulation.

CHARLES DAVIES

Many of the features of **Psion's** Spectrum flight simulation are straight out of the cockpit of a Boeing 747.

All information systems are displayed as dials just as in a real plane. These tell you your altitude, rate of climb, speed, wind and weather conditions, and your position.

The program gives you two screen presentations. The first of these shows the view from the cockpit with the instruments described above in the lower half of the screen and the view of the horizon in the top.

The plane can be made to bank, roll, dive, climb and even loop the loop — though you will have to be a pretty good pilot to make it do this.

The second screen presentation shows a map with your plane flashing its rate or progress towards your chosen destination. The airports are represented as flashing beacons with the land and lakes shown.

A masterful piece of programming and undoubtedly one of the best flight simulations yet to be produced for a micro.

Flight Simulation runs on a Spectrum in 48K and is available from larger branches of W. H. Smith at **£7.95.**

- **Getting started** 9
- **Value** 9
- **Playability** 8

ZX81

Flight Simulation is one of the best programs I have ever seen for the Sinclair ZX81.

After loading, which takes about six minutes, the program runs a check to see if it has loaded correctly. If it has you may proceed, if not, reload.

The program places you in the pilot's seat of a twin-engined propeller plane searching for the airport beacons in poor visibility.

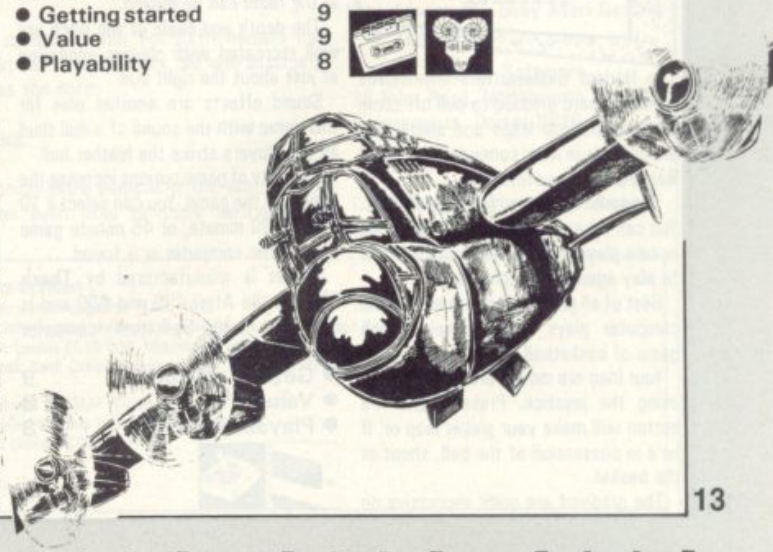
The game gives you three screen presentations. The view of the horizon as seen from the cockpit. A map of the Mediterranean with landing beacons and the position of your aircraft. Towards your final approach you can also request a visual display of the runway and landing lights.

Newcomers to the game can start off by just playing the final approach part of the game. It is a tough test of your skill and it will take you several attempts to touch down safely. More experienced pilots can select a number of extra difficulty features such as 'wind effects' and 'full feature'.

When in the cockpit display the top half of the screen shows a view of the cockpit windows where you will see the horizon formed by the sky and the ground. As the altitude of the plane changes, so the visual horizon will move to display the effects of banking, diving and climbing.

Flight Simulation runs on a ZX81 and is available from **Psion's** W. H. Smith outlets for **£9.95.**

- **Getting started** 8
- **Value** 9
- **Playability** 9



SPORT GAMES

VIC-20

Alien Soccer is probably going to surprise most of its purchasers.

The program for the Vic-20 claims to be "The wierdest game of soccer you've ever played". It lives up to that claim but not in the way the player would hope, being more reminiscent of pinball than football.

The aliens are there all right, two blue ones on your side set about a goal's width apart and four green ones facing you on the far side of the screen.

On the pitch itself are five large pink creatures which are unmovable and act much in the same way as bumpers on a pintable.

A ball is served up, flicked on usually by the two sets of green invaders as they bounce up and down between the top and bottom of the screen, then bounces into the large pink variety flinging about before heading it out towards your side of the screen which must be protected by your own two aliens.

Send it back if you can, I certainly found it hard to use my two defenders to good effect and the game was over within seconds as a rule. There are five skill levels but level five looked impossible and level one was quite hard enough.

After a while leaping invaders appear on the screen creating further havoc.

The good breakout or pong player may enjoy the game but it was beyond me and the title is sadly misleading.

It costs **£9.99** from **Rabbit Software.**

- **Getting started** 7
- **Value** 3
- **Playability** 4

ATARI

The Harlem Globetrotters themselves would be hard pressed to pull off some of the incredible leaps and shots that are possible in Atari computer simulated Basketball.

The game offers you five play options. You can take on the computer with one or two players or team up with a friend to play against the computer.

Best of all play against a friend as the computer plays an extremely tough game of basketball.

Your men are moved around the court using the joystick. Pressing the fire button will make your player leap or, if he's in possession of the ball, shoot at the basket.

The graphics are quite impressive on this game — the men's limbs move and the ball moves across court in slow arcs to give the impression of depth.

Basketball runs on Atari 400 and 800 and comes out of **Atari** catalogue in cartridge form or from Spectrum computer shops at **£24.99.**

- **Getting started** 9
- **Value** 6
- **Playability** 6

Score the winner in the FA Cup final with this latest soccer simulation game and a little bit of imagination.

You control up to four players moving them around the pitch with the joystick and depressing the fire button to shoot.

Up to four players can be moved at any time — the player possessing the ball dictates which of the eleven players in the team can be moved.

The depth and scale of the pitch are well recreated with players appearing at just about the right size.

Sound effects are another plus for this game with the sound of a dull thud as the players strike the leather ball.

A variety of game options increase the appeal of the game. You can select a 10 minute, 30 minute, or 45 minute game against the computer or a friend.

Soccer is manufactured by **Thorn EMI** for the Atari 400 and 800 and is available from Spectrum computer shops at **£29.84.**

- **Getting started** 9
- **Value** 8
- **Playability** 8

Artful animations

Most computers acquire a library of sports simulations after they have been around for some time.

The Atari now has several sports titles from standard soccer and basketball type games to more unlikely indoor sports such as darts and snooker.

Graphics are important in sports simulations. Look for accurately marked pitches, thoughtful scaling, and authentic movements of the ball.

In games that involve a lot of running, look for authentic simulation of the running motion of the players. Nothing is more ridiculous than a player moving around a sports field without moving his legs.

Of course, computers are not yet sophisticated enough to reproduce all the elements of a game on a TV screen but they are easily capable of giving an enjoyable game if the cartridge has been well thought out.

It should have two player options and also the facility to play against the computer when your friend is not around.

The two player option if it is to be really effective should allow for simultaneous participation by two players.

Finally, sound effects are also important in sports simulations. Check to make sure the computer produces some audible signal whenever the ball is struck or kicked and also when a goal or point is scored. Some of the better sports simulations have authentic sounding effects such as a leather ball being kicked, or the sliding of skis, even the cheering of the crowd has been incorporated in some games.

All these things help to make a good game. The golden rule, however, as with buying all computer games, is to play them first whenever possible.

EUGENE LACEY

About the only thing missing from **Thorn EMI's** darts program is the TV commentator's shriek of, "Wun-hundred-and-eightyyy!"

The game, for the Atari 400/800, takes place inside a public house with a keen, and rather slim-looking, darts player standing a regulation distance away from his board.

When the game is in play, the marvellous graphics are added to by a close-up of the board itself in the bottom right hand side of the screen with a hand hovering close by.

An eye-catching feature of this game is the sound effects which, if you hit a wire and bounce out, respond with a realistic chink and thud.

You begin play by selecting a game from 301 to 901 and choosing a skill level between 0 and 9. The hand holding the dart hovers over the board and you have to judge carefully when to fire as the finger tip hits the part you think you need.

Darts costs **£19.95,** expensive for a cassette despite the good packaging.

- **Getting started** 9
- **Value** 5
- **Playability** 9

TT Racer brings you all the thrills and spills of the Isle of Man super-bike races.

The game challenges you to race against the clock and see how far you can get along an obstacle filled race track.

Push your joystick forward to accelerate — but not too far or you will crash straight into the crowd losing time.

The track scrolls down the screen as you are shown an aerial view — including rooftops and trees. The track becomes increasingly more difficult.

The sound effects are an impressive element of this game. The acceleration sounds are particularly convincing.

The first major obstacle you must negotiate is a fork junction with an oil slick on one side and clear track on the other. You must make a quick decision on your course and then accelerate away before the slick switches back under your tyres!

Once through this you will have to steer over narrow bridges, wait at traffic lights, and dodge in and out of square green obstacles.

When a minute has elapsed the game ends and you are given a score read-out based on how far you got.

TT Racer is the first of a range of sports simulations for Atari 400 and 800 from **Centaursoft** at **£19.95. £19.95.**

- **Getting started** 8
- **Value** 5
- **Playability** 7

SPECTRUM

If you like pretty pretty graphics then Horace Goes Skiing may be just the game for you.

The cute comic book character was first introduced to Spectrum owners last year when Psion Software launched their Hungry Horace game. In that episode the mischievous little gobbler ate the park attendant's sandwiches and prize winning daisies.

The game begins with Horace attempting to get across a busy road as lorries, vans and cars thunder by. You must get him to the other side of the road without getting him killed. You have three lives in which to do this.

Once he is safely across the road he can pick up his skis from his shed, put them on, hobble back across the road and then begin his attempt on the slalom.

The first few flags are widely spaced and can be taken nice and gently. The game gets progressively difficult.

Splendid graphics, an addictive game, and a lovable character in the shape of Horace all for **£5.**

Horace Goes Skiing runs on a Spectrum in 16 or 48K and is distributed by **Psion** in W. H. Smiths.

- **Getting started** 8
- **Value** 8
- **Playability** 7

ADDRESS FILE

Abbex Software
20, Ashley Court, Great Northway, London NW4.

Abersoft
7 Maes Afallen, Bow Street, Dyfed SY24 5BA.

Acornsoft
4a Market Hill, Cambridge, CB2 3NJ.

Allrian
1000a Uxbridge Road, Hayes, Middx. UB4 0RL.

Apex Software
115 Crescent Drive, Brighton, Sussex BN2 6SB.

Artic Computing
396 James Reckitt Avenue, Hull, N. Humberside HU8 0JA.

Atari International
Windsor House, 185-195 Ealing Road, Alperton, Wembley, Middx. **(Any Atari Dealer)**

Audiogenic
PO Box 88, Reading, Berks.

Automata Cartography
65a Osbourne Road, Portsmouth, Hants. PO5 3IR.

BBC Publications
Broadcasting House, Portland Place, London W1. **(Any BBC Dealer)**

Bridge Software
36 Fernwood, Marple Bridge, Stockport, Cheshire.

Bug-Byte
The Albany, Old Hall Street, Liverpool L3 9EG.

Campbell Systems
Rous Road, Buckhurst Hill, Essex IG9 6BL.

Centaur Software
6 Purcells Avenue, Edgware, Middx.

Centresoft
26 Great Cornbow, Halesowen, West Mids B6 3AE.

Commodore
675 Ajax Avenue, Trading Estate, Slough, Berks. **(Any Commodore Dealer)**

Computer Concepts
Dept. WM1, 16 Wayside, Chipperfield, Herts. WD4 9JJ.

Electric Pencil Company
1 Mount Vernon, Hull, N. Humberside.

Gemini Electronics
50 Newton Street, Manchester.

Hewson Consultants
60a St Mary's Street, Wallingford, Oxon. OX10 0EL.

Imagine Software
Masons Buildings, Exchange Street East, Liverpool L2 3PN.

Mac Games
See Morris Associates for this address.

Melbourne House
131 Trafalgar Road, Greenwich, London SE10.

Microx
52 The Strand, Worthing, Sussex.

Molimerx
1 Buckhurst Road, Town Hall Square, Bexhill-on-Sea, East Sussex.

Morris Associates
37 St Catherines Road, Baglam, Port Talbot, West Glam. SA12 8AJ.

New Generation Software
16 Brendon Close, Oldland Common, Bristol.

Pete & Pam Computers
New Hall Hey Road, Rawtenstall, Rossendale, Lancs. BB4 6JG.

Postern Limited
PO Box 2, Andoversford, Cheltenham, Glos. GL4 5SW.

Program Power
8/8a Regent Street, Chapel Allerton, Leeds LS7 4PE.

Psion
2 Huntsworth Mews, London NW1 6DD. **(Larger branches of W H Smith)**

Quicksilva
92 Northern Road, Southampton SO2 0PB.

Rabbit Software
380 Station Road, Harrow, Middx.

Salamander
27 Ditchley Rise, Brighton, East Sussex BN1 4QL.

Sharpsoft
86-90 Paul Street, London EC1.

Softek
329 Croxted Road, London SE24.

Spider Software
98 Avondale Road, South Croydon, Surrey.

Supersoft
Winchester House, Canning Road, Wealdstone, Harrow, Middx.

S.B.D. Software
15 Jocelyn Road, Richmond, Surrey TW9 2TJ.

Terminal Software
28 Church Lane, Prestwich, Manchester M25 5AJ.

Texas Instruments
Manton Lane, Bedford, Beds. MK41 7PA. **(Any Texas Dealer)**

Thorn EMI
Thorn EMI House, Upper St Martins Lane, London W1. **(Any Atari Dealer)**

Viking Software
28 New Road, Northbourne, Bournemouth, Dorset BH10 7DS.

Workforce
140 Wilsden Avenue, Luton, Beds. LU1 5HR.

Ratings rundown

Here is a rundown of the categories our review team used to mark the games featured in this supplement.

Each game received ratings in three categories. These are defined as "Getting started": problems loading the tape and a measure of how much help a cassette or disc gives, in making the game easily accessible to the buyer.

"Value" looks at the value-for-money question and takes into account whether the game utilises all the facilities of the machine, presentation and packaging.

"Playability" refers to the enjoyment the game offers, whether it would hold the reviewers' interest or whether it is a good example of the type of game it is based on.

Each mark was made out of a possible 10 and we hope it will provide an accurate guide.

Symbols guide

The symbols beneath each review provide a quick check on what you will need to run that particular game on your computer. See the details below:

1. The game is available on cassette only. Not in disc or cartridge form.

2. The game is available in disc form only and not on cassette or cartridge.

3. The game needs extra memory to run. For ZX81 owners this will mean a 16K Rampack. For Atom owners we will assume a fully expanded computer as the norm.

4. The game uses a joystick.

5. The game needs something extra plugged in the user port to run. This symbol has also been used to show cartridge-only games.

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GAMES GLOSSARY

If you can tell a Pacman from a Defender and a Galaxian from a Space Invader you probably know your way around computer games.

But if some of the game terms we have used in this supplement, or in the issue itself, are new to you, then this page should supply the answers. In it we take some of the best known types of computer game and describe how they are played and what features these games normally incorporate.

So, if we claim that Penetrator is a "Scramble-type game" and that leaves you just as much in the dark about what to expect, then below there is a full description of Scramble to put you in the picture.

Asteroids

The Asteroids came into the arcades courtesy of Atari. It features a small dart-shaped craft controlled by the player which can rotate left or right and thrust or fire in the direction it is facing.

There is one further control, the panic button (hyperspace) which lets you travel to another part of the screen chosen by the computer.

The enemy is mainly made up of large asteroids which sweep across the screen in large deadly groups of rock. When blown up these break into smaller fragments worth extra points.

There is extra danger supplied by two UFOs. The first larger creature you'll meet fairly early on. It tends to spray shots in all directions and often crashes into an asteroid.

The smaller variety is far more deadly in its own shooting and also more difficult to hit. Each cleared screen means you start again with extra asteroids.

Defender

You can't expect to keep a finger on every control button in Defender or you'd end up in knots.

The action, which takes place above an alient landscape, involves some seven control buttons and takes patience to gain proper mastery of your lone craft.

That patience can be rewarded though, as Defender is challenging from the word "Go". The Defender craft can go: up, down, thrust forward, reverse direction, fire, smart bomb and hyperspace.

Ten humanoids wander on the landscape and these may fall prey to raiding alien creatures known as Landers. Landers pick up the humanoids and take them to the top of the screen. If they succeed in getting there the Landers turn into fearsome mutants hellbent on your destruction.

In all there are six alien opponents. On top of Landers and Mutants, these are: Pods are quite harmless but contain the small and persistent Swarmers; Bombers seed space with white bombs and Baiters only appear if you take too long clearing a screen of the rest of the aliens.

If all 10 humanoids are captured, the planet explodes and all remaining alien life attacks your craft at once.

Defender games usually feature a small radar screen which shows what is going on at all parts of the planet surface.

Frogger

Frogger has spawned a whole host of computer games with a similar theme.

This game features a frog hero who must jump across a road and make his way across a river torrent to five frog-holes in the bank.

The busy road usually features five streams of traffic travelling in both directions at varying speeds, between which the player must hop his frog without wrapping it around any fenders.

Once across the road, the river can be crossed by leaping onto floating logs and onto the back of swimming turtles, until our frog can enter a vacant spot in the far bank. Turtles have a habit of diving though so don't let a frog dally too long on one. Being carried off the edge of the screen (by log or turtle) also results in a note in the funeral column of *Amphibians' Weekly*.

When all five frog-holes have been filled, the game becomes more difficult with extra traffic being added to the road, snakes traversing the bank between road and river and alligators appearing instead of logs in the river.

A timer running down on each frog also adds to the difficulties. The arcade original also featured a small lady frog who could be "picked up" on the logs and offered a lift home for a bonus. Other bonuses can be scored by entering a frog-hole in which a tasty fly meal has come to rest.

Donkey Kong

Donkey Kong is the strange name for a climbing and jumping game which features a starlet-grabbing monster gorilla.

Often referred to as Crazy Kong or Crazy Climber in the computer circles, it has only just found its way onto the home screen.

The game features a gorilla holding a girl captive at the top of the screen and an intrepid hero (Mario the carpenter), who starts at the bottom of the screen.

Between the two is a connecting network of platforms and ladders up which Mario must run to achieve his rescue. Kong hurls barrels down the screen and Mario makes use of his "jump" button to leap over them. He can also grab a hammer and smash the barrels as they approach him.

Once at the top of the screen a new complex is built with Mario, again starting from the bottom with a view to rescue. This time the screen features a series of conveyor belts and deadly fires which travel around on the ladders and belts.

Galaxians

The Galaxians were the sons of Space Invaders. Instead of proceeding down the screen at a leisurely pace, they wavered at the top of the screen before swooping down in batches of two or three (or more often on a solo mission) firing bombs.

The player has the usual left, right and fire controls on his laser base and must take care not to get trapped in a corner. He scores double points for a galaxian hit in mid-swoop and there are bonus points for taking out the red fleet commanders, who usually descend flanked by their generals, dispersing bombs at such a rate that the first instinct is to flee for cover.

That is the essence of Galaxians but with each destroyed platoon, new waves appear at screen top and their attacks become more frequent, more accurate and, all too often, more deadly!

Pacman

The ghostly world of Pacman is made up of a dot-filled maze, a hungry dot-eater and four pursuing spectres.

Pacman variations can be found under a whole range of titles from Vic-men to Gobbleman, Snapper to Super Glooper and many others. Most dot-eating games are related to it.

The main character is the dot-eater, which travels around the maze, eating every dot he touches. His objective is to clear the screen of dots. He is hampered in this by the four chasing ghosts whose touch is lethal.

The Pacman's main defence against the ghosts, who usually number four, are energiser dots. These pulse in the four corners of the maze and, upon being eaten, reverse the roles for a short while.

This means that Pacman can turn the tables on the ghosts and eat them for bonus points. He is allowed only a few seconds of dominance before the usual hunter and hunted rules come back into operation.

It is also usual for fruits to appear on the screen occasionally and these too can be consumed by Pacman for bonus points. When Pacman has cleared the screen, it refills with dots and the game restarts except that this time the ghosts are a little livelier and a new fruit, worth extra points, appears at this level.

Scramble

Scramble should have a big one-way sign on its cabinet. The screen rolls from right to left, taking the player's craft along it into ever-increasing danger.

Scramble variations often contain the word "Mission" or "Attack" but there are some wierd and wonderful titles about.

The player controls a craft heading right across the screen over hilly terrain. His craft can never turn around and opt out of its mission but he does have some control over his destiny.

His controls are up and down, fast and slow and he can both bomb and fire at his enemies.

The Scrambler is not usually equipped with enough fuel to complete his task, but it is normal to obtain more fuel by bombing fuel tanks on the ground and so (mysteriously) replenish his own stocks.

The enemies come in all shapes and sizes. Most common are missiles which fire up from the ground as your craft passes overhead and alien invader creatures which frequently inhabit caves and fly at the player's craft.

The original Scramble game sent the player through a series of different terrains with new challenges in each section. And most computer Scrambles attempt to duplicate this with a number of different stages.

Scramble requires a cool head which can find the right control in a crisis, but it makes an ideal computer game as success naturally leads to new and more difficult stages.

Invaders

Space Invaders started the whole computer game craze back in 1977 and most gamers know the format backwards. Still, just a brief resume....

The invaders come in waves above the ground and move in rows across the screen one step at a time, firing missiles earthwards.

When one row of the aliens reach an edge of the screen, the whole platoon jump down a line and return back the way they came. When they achieve their slow progression to the bottom of the screen, the game ends.

The player controls a laser base which moves left to right and fires directly up from its position. His aim is to blow up the entire fleet before it reaches the bottom of the screen.

Flying saucers move across the top of the screen in both directions and can be hit for a mystery bonus score. In the arcade original, top saucer scores of 300 were achieved by firing 22 shots before shooting at the first saucer, then firing 14 shots in between each subsequent saucer. Some computer versions have copied this technique.